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LGM-30B, STAGE II DISSECTED MOTORS.(U)
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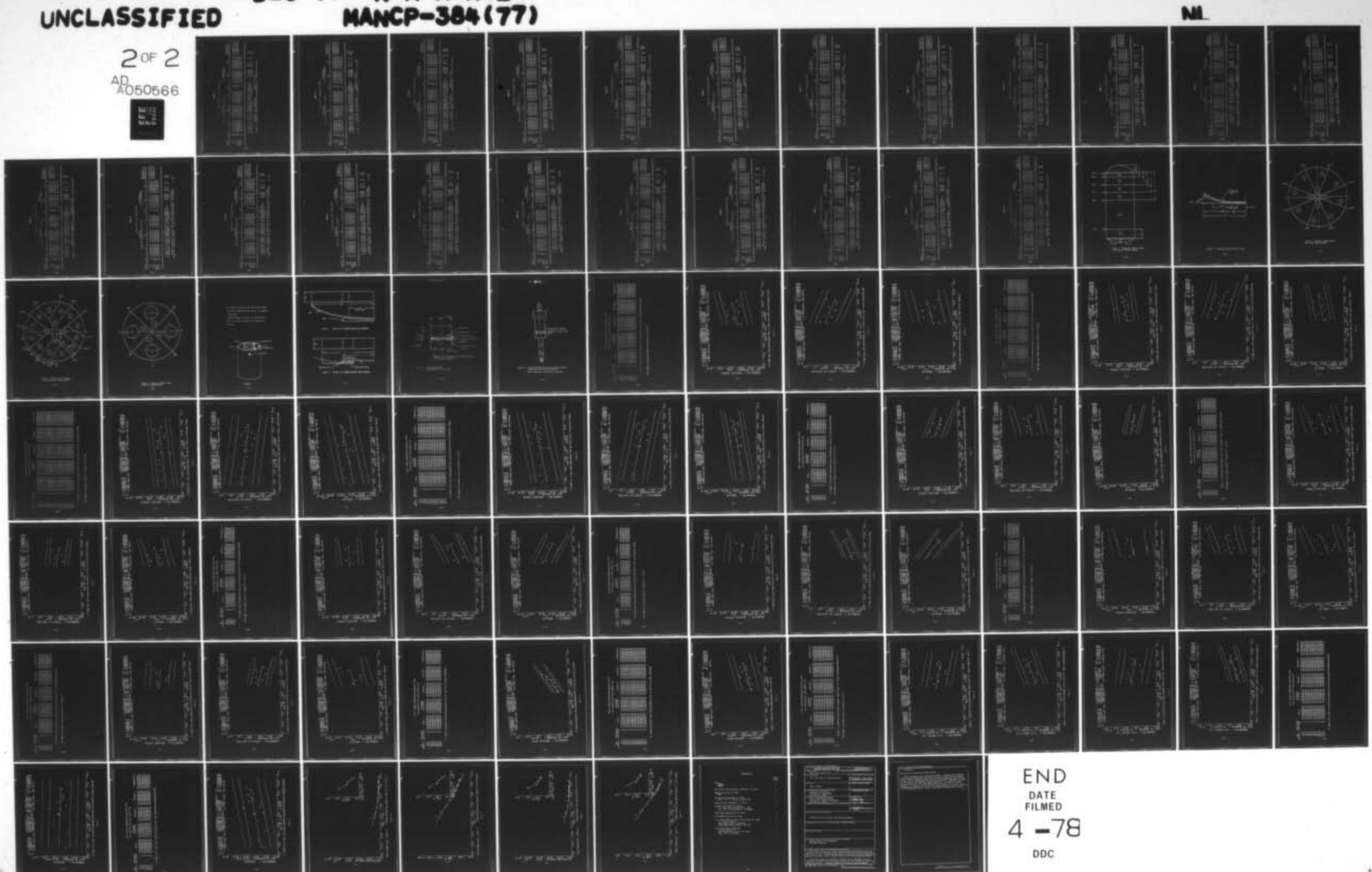

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TABLE 46

ANALYSIS OF COVARIANCE TABLE

		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
135	27	0.864069E+04	-.379610E+05	0.418528E+06	26	0.251755E+06	0.968287E+04	-.4393284E+01
543	30	0.131587E+05	-.430800E+04	0.194060E+06	29	0.193250E+06	0.666378E+04	-.3273866E+00
786	25	0.887862E+04	-.145390E+05	0.945860E+05	24	0.707580E+05	0.294825E+04	-.1637527E+01
WITHIN	82	0.306781E+05	-.568080E+05	0.707754E+06	81	0.602560E+06	0.743901E+04	-.1851747E+01
AMONG	2	0.212294E+04	0.831340E+05	0.325593E+07	1	0.409000E+03	0.409000E+03	
TOTAL	84	0.328010E+05	0.263260E+05	0.396368E+07	83	0.394255E+07	0.475006E+05	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 6.6475 DF = 2, 79
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 224.4915 DF = 2, 81
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 14.1409 DF = 1, 81

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) L.RATE (X-HD/SPEED =0.2) 77 DEG F. MODULUS

TABLE 47

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
135	35	0.125582E+05	-.170937E+03	0.516944E+04	34	0.516711E+04	0.151974E+03	-.1361157E-01
583	34	0.164877E+05	0.160716E+05	0.210068E+05	33	0.534039E+04	0.161830E+03	0.974776E+00
788	34	0.122510E+05	0.813312E+04	0.862250E+04	33	0.322313E+04	0.976706E+02	0.663874E+00
WITHIN	103	0.412969E+05	0.240340E+05	0.347987E+05	102	0.208114E+05	0.204034E+03	0.581980E+00
AMONG	2	0.363706E+04	0.167700E+04	0.677112E+04	1	0.599768E+04	0.599768E+04	
TOTAL	105	0.449340E+05	0.257110E+05	0.415700E+05	104	0.268583E+05	0.258253E+03	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 25.7847 DF = 2. 100
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 14.8183 DF = 2. 102
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 68.5539 DF = 1. 102

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) L.RATE (X-HD/SPEED =2.0) 77 DEG F. MAX STRS

TABLE 48

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
135	35	0.125582E+05	-.118892E+02	0.199726E+00	34	0.188470E+00	0.554325E-02	-.9467199E-03
583	34	0.164877E+05	-.470850E+01	0.139947E+00	33	0.138602E+00	0.420007E-02	-.2855801E-03
788	34	0.122510E+05	0.252124E+01	0.739603E-01	33	0.734414E-01	0.222550E-02	0.2057990E-03
WITHIN	103	0.412969E+05	-.143764E+02	0.413233E+00	102	0.408835E+00	0.400819E-02	-.3408600E-03
AMONG	2	0.363706E+04	-.217244E+02	0.193163E+00	1	0.634022E-01	0.634022E-01	
TOTAL	105	0.449340E+05	-.358008E+02	0.606796E+00	104	0.578272E+00	0.556031E-02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.0388 DF = 2. 100
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 21.1363 DF = 2. 102
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.1971 DF = 1. 102

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) L.RATE (X-HD/SPEED =2.0) 77 DEG F. STRN/RUP

TABLE 49

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	32	0.117436E+05	0.796400E+04	0.116221E+07	31	0.115681E+07	0.373163E+05	0.6781588E+00
583	34	0.164877E+05	0.104586E+06	0.106984E+06	33	-.556434E+06	-.168616E+05	0.6343279E+01
788	31	0.114957E+05	0.314840E+05	0.564448E+06	30	0.478221E+06	0.159407E+05	0.2738750E+01
WITHIN	97	0.397270E+05	0.144034E+06	0.279650E+07	96	0.227429E+07	0.236905E+05	0.3625594E+01
AMONG	2	0.365400E+04	0.505230E+05	0.117510E+07	1	0.476535E+06	0.476535E+06	
TOTAL	99	0.433810E+05	0.194557E+06	0.397160E+07	98	0.309904E+07	0.316229E+05	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 52.1026 DF = 2. 94
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 17.4069 DF = 2. 96
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 22.0430 DF = 1. 96

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) L.RATE (X-HD/SPEED =2.0) 77 DEG F. MODULUS

TABLE 50

ANALYSIS OF COVARIANCE TABLE

		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			REGRESSION
SOURCE	DF	X	XY	Y	DF	SS	MS	COEFFICIENT
135	40	0.134499E+05	-.154812E+03	0.472500E+04	39	0.472722E+04	0.121211E+03	-.1151026E-01
583	41	0.181837E+05	0.107270E+05	0.123857E+05	40	0.605765E+04	0.151441E+03	0.5899229E+00
788	34	0.128836E+05	0.274619E+04	0.196800E+04	33	0.136064E+04	0.418375E+02	0.2131543E+00
WITHIN	115	0.445172E+05	0.133184E+05	0.190807E+05	114	0.150962E+05	0.132423E+03	0.2991732E+00
AMONG	2	0.356875E+04	0.136016E+05	0.534652E+05	1	0.162522E+04	0.162522E+04	
TOTAL	117	0.480860E+05	0.269200E+05	0.725460E+05	116	0.574754E+05	0.495477E+03	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 13.4907 DF = 2. 112
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 160.0139 DF = 2. 114
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 30.0892 DF = 1. 114

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) L.RATE (X-HD/SPEED =2.0) 77 DEG F. MAX STRS

TABLE 51

ANALYSIS OF COVARIANCE TABLE

		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
135	40	0.134499E+05	0.754907E+01	0.130360E+00	39	0.126123E+00	0.323391E-02	0.561272DE-03
583	41	0.181637E+05	-.164626E+02	0.221146E+00	40	0.206241E+00	0.515603E-02	-.905350IF-03
798	34	0.128836E+05	0.203125E+02	0.130858E+00	33	0.988333E-01	0.299495E-02	0.157662IE-02
WITHIN	115	0.445172E+05	0.113989E+02	0.486601E+00	114	0.483682E+00	0.424282E-02	0.256056DE-03
AMONG	2	0.356875E+04	-.502114E+02	0.830400E+00	1	0.123939E+00	0.123939E+00	
TOTAL	117	0.480860E+05	-.388125E+02	0.131700E+01	116	0.128567E+01	0.110834E-01	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES =	6.8163	DF =	2.	112
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS =	94.5115	DF =	2.	114
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT =	0.6879	DF =	1.	114

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) L.RATE (X-HD/SPEED =2.0) 77 DEG F. STRN/RUF

TABLE 52

ANALYSIS OF COVARIANCE TABLE

		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
135	37	0.128990E+05	-.367600E+04	0.139451E+07	36	0.139346E+07	0.387073E+05	-.2649833E+00
583	41	0.181637E+05	0.621530E+05	0.732041E+06	40	0.519599E+06	0.129900E+05	0.3418059E+01
788	31	0.122509E+05	0.135290E+05	0.145385E+06	30	0.130445E+06	0.434815E+04	0.1104329E+01
WITHIN	109	0.433336E+05	0.720060E+05	0.227194E+07	108	0.215229E+07	0.199286E+05	0.1661665E+01
AMONG	2	0.359237E+04	0.175580E+06	0.867229E+07	1	0.373000E+05	0.373000E+05	
TOTAL	111	0.469160E+05	0.247866E+06	0.109442E+08	110	0.983449E+07	0.875862E+05	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.8213 DF = 2. 106
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 187.7253 DF = 2. 108
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 6.0039 DF = 1. 108

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) L.RATE (X=HD/SPEED =2.0) 77 DEG F. MODULUS

TABLE 53

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	18	0.506612E+04	-.412000E+03	0.256500E+04	17	0.253149E+04	0.148911E+03	-.813244E-01
583	18	0.600719E+04	0.711800E+04	0.108230E+05	17	0.242879E+04	0.142870E+03	0.118491E+01
788	18	0.529981E+04	0.485100E+04	0.165430E+05	17	0.121028E+05	0.711930E+03	0.915315E+00
WITHIN	54	0.163731E+05	0.115570E+05	0.299710E+05	53	0.218135E+05	0.411575E+03	0.705851E+00
AMONG	2	0.173551E+04	0.439500E+04	0.126550E+05	1	0.152506E+04	0.152506E+04	
TOTAL	56	0.181089E+05	0.159520E+05	0.426240E+05	55	0.285720E+05	0.519491E+03	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 7.0992 DF = 2. 51
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 6.2106 DF = 2. 53
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 19.6203 DF = 1. 55

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) TRIAX. (X-HD/SPEED=1750),77 DEG F.AT 500 PSI,MAX STRS

TABLE 54

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X (CORRECTED SUMS OF SQUARES AND PRODUCTS)	XY	Y	DF (DEVIATIONS ABOUT REGRESSION)	SS	MS	REGRESSION COEFFICIENT
135	21	0.570350E+04	0.100110E+02	0.329370E-01	20	0.153654E-01	0.768269E-03	0.1755235E-02
583	21	0.673750E+04	0.159580E+02	0.502844E-01	20	0.124873E-01	0.624365E-03	0.2368535E-02
788	22	0.615687E+04	0.107466E+02	0.352163E-01	21	0.164586E-01	0.783741E-03	0.1745460E-02
WITHIN	64	0.185979E+05	0.367156E+02	0.118438E+00	63	0.459546E-01	0.729438E-03	0.1974161E-02
AMONG	2	0.186094E+04	-.796460E+01	0.455179E-01	1	0.114303E-01	0.114303E-01	
TOTAL	66	0.204588E+05	0.287510E+02	0.163556E+00	65	0.123552E+00	0.190079E-02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.1311 DF = 2. 61

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 56.1896 DF = 2. 63

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 99.3685 DF = 1. 63

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)

STAGE II DISSECTED (OUTER) TRIAX. (X-HD/SPEED=1750),77 DEG F.AT 500 PSI.STRN/RUP

TABLE 55

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	21	0.570350E+04	-.353600E+04	0.316449E+08	20	0.314427E+08	0.158214E+07	-.6199701E+00
5P3	21	0.673750E+04	0.162776E+06	0.206697E+08	20	0.167371E+08	0.836854E+06	0.2415970E+02
788	22	0.515667E+04	-.135961E+06	0.458056E+08	21	0.428032E+08	0.203825E+07	-.2208276E+02
WITHIN	64	0.185579E+05	0.232790E+05	0.981202E+08	63	0.980910E+08	0.155700E+07	0.1251701E+01
AMONG	2	0.186094E+04	0.766250E+05	0.371558E+07	1	0.393662E+06	0.393662E+06	
TOTAL	66	0.204566E+05	0.101904E+06	0.101836E+09	65	0.101326E+09	0.155889E+07	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.3107 DF = 2. 61
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.0395 DF = 2. 63
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.0187 DF = 1. 63

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) TRIAX. (X-HD/SPEED=1750),77 DEG F.AT 500 PSI.MODULUS

TABLE 56

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
135	19	0.529981E+04	0.211600E+04	0.562500E+04	18	0.478017E+04	0.265565E+03	0.3992593E+00
583	17	0.599900E+04	0.123250E+05	0.991910E+05	16	0.738692E+05	0.461682E+04	0.2054508E+01
738	16	0.480394E+04	0.470900E+04	0.336470E+05	15	0.290311E+05	0.193540E+04	0.9802375E+00
WITHIN	52	0.161027E+05	0.191500E+05	0.158463E+06	51	0.115689E+06	0.226841E+04	0.1189238E+01
AMONG	2	0.155862E+04	0.575100E+04	0.251370E+05	1	0.391702E+04	0.391702E+04	
TOTAL	54	0.176614E+05	0.249010E+05	0.163600E+06	53	0.128492E+06	0.242437E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.8222 DF = 2, 49

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 2.8219 DF = 2, 51

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 10.0396 DF = 1, 51

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)

STAGE II DISSECTED (INNER) TRIAX. (Y=HD/SPEED=1750),77 DEG F.AT 500 PSI.MAX STRS

TABLE 57

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	19	0.529981E+04	0.955078E+01	0.645943E-01	18	0.473828E-01	0.263238E-02	0.180209E-02
588	20	0.675725E+04	0.851465E+01	0.136162E+00	19	0.125401E+00	0.660004E-02	0.126381E-02
788	19	0.532925E+04	0.900577E+01	0.132050E+00	18	0.116817E+00	0.648966E-02	0.168062E-02
WITHIN	58	0.173663E+05	0.270752E+02	0.332806E+00	57	0.290594E+00	0.509813E-02	0.155906E-02
AMONG	2	0.109094E+04	-.815970E+01	0.105368E+00	1	0.438874E-01	0.438874E-01	
TOTAL	60	0.184572E+05	0.188655E+02	0.438173E+00	59	0.418850E+00	0.709914E-02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.0942 DF = 2, 55
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 12.5787 DF = 2, 57
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 8.2799 DF = 1, 57

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) TRIAX. (X-HD/SPEED=1750),77 DEG F.AT 500 PSI,STRN/RUP

TABLE 58

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	19	0.529981E+04	0.455990E+05	0.227082E+08	18	0.223159E+08	0.123977E+07	0.8603889E+01
583	20	0.673725E+04	0.171057E+06	0.544558E+08	19	0.501127E+08	0.263751E+07	0.2536972E+02
788	19	0.532925E+04	-.379560E+05	0.675103E+08	18	0.672300E+08	0.373500E+07	-.7122202E+01
WITHIN	56	0.173663E+05	0.178700E+06	0.144654E+09	57	0.142825E+09	0.250571E+07	0.1025604E+02
AMONG	2	0.109094E+04	0.105640E+05	0.410966E+07	1	0.400676E+07	0.400676E+07	
TOTAL	60	0.184572E+05	0.189264E+06	0.148773E+09	59	0.146833E+09	0.248869E+07	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.6236 DF = 2. 55
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 0.7996 DF = 2. 57
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.7339 DF = 1. 57

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) TRIAX. (X-HD/SPEED=1750),77 DEG F.AT 500 PSI,MODULUS

TABLE 59

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	6	0.163544E+04	0.192862E+04	0.197720E+05	5	0.174976E+05	0.349952E+04	0.1179271E+01
583	8	0.174200E+04	0.261337E+04	0.126230E+05	7	0.870257E+04	0.124320E+04	0.1500215E+01
788	10	0.198056E+04	0.100000E+04	0.632000E+05	9	0.626951E+05	0.696612E+04	0.5049069E+00
WITHIN	24	0.535800E+04	0.554200E+04	0.955950E+05	23	0.898627E+05	0.390707E+04	0.1034341E+01
AMONG	2	0.113075E+04	0.178000E+03	0.563470E+05	1	0.563190E+05	0.563190E+05	
TOTAL	26	0.648875E+04	0.572000E+04	0.151942E+06	25	0.146900E+06	0.587598E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.1143 DF = 2. 21
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 7.2992 DF = 2. 23
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.4672 DF = 1. 23

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 10 SEC

TABLE 60

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	6	0.163544E+04	0.198862E+04	0.117720E+05	5	0.935391E+04	0.187078E+04	0.1215559E+01
583	8	0.178200E+04	0.120000E+04	0.800000E+04	7	0.717336E+04	0.102477E+04	0.6888633E+00
788	10	0.198056E+04	-.120906E+04	0.226190E+05	9	0.218809E+05	0.243121E+04	-.6104641E+00
WITHIN	24	0.535800E+04	0.197956E+04	0.423910E+05	23	0.416596E+05	0.181129E+04	0.3694592E+00
AMONG	2	0.113075E+04	0.164375E+02	0.347060E+05	1	0.347057E+05	0.347057E+05	
TOTAL	26	0.648875E+04	0.199600E+04	0.770970E+05	25	0.764830E+05	0.305932E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.6889 DF = 2. 21
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 9.6129 DF = 2. 23
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.4038 DF = 1. 23

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 50 SEC

TABLE 61

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
135	6	0.163544E+04	0.100287E+04	0.948600E+04	5	0.867102E+04	0.177420E+04	0.6132150E+00
583	8	0.174200E+04	0.155337E+04	0.755000E+04	7	0.617083E+04	0.881546E+03	0.6917193E+00
788	10	0.198056E+04	-.909062E+03	0.234190E+05	9	0.230017E+05	0.255575E+04	-.4589920E+00
WITHIN	24	0.535800E+04	0.164719E+04	0.404610E+05	23	0.399546E+05	0.173716E+04	0.3074257E+00
AMONG	2	0.113075E+04	0.228812E+03	0.342060E+05	1	0.341597E+05	0.341597E+05	
TOTAL	26	0.648875E+04	0.187600E+04	0.746670E+05	25	0.741246E+05	0.296498E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.5274 DF = 2. 21
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 9.8350 DF = 2. 23
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.2915 DF = 1. 23

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 100 SEC

TABLE 62

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
135	6	0.163544E+04	0.317187E+03	0.548600E+04	5	0.542448E+04	0.106490E+04	0.1939465E+00
593	8	0.174200E+04	0.653375E+03	0.275556E+04	7	0.251050E+04	0.358643E+03	0.3750716E+00
778	10	0.198056E+04	-.729062E+03	0.162190E+05	9	0.159506E+05	0.177229E+04	-.3681087E+00
WITHIN	24	0.535800E+04	0.241500E+03	0.244706E+05	23	0.244497E+05	0.106303E+04	0.4507278E-01
AMONG	2	0.113075E+04	0.735500E+03	0.202604E+05	1	0.197961E+05	0.197961E+05	
TOTAL	26	0.648875E+04	0.980000E+03	0.447410E+05	25	0.446930E+05	0.178372E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.2480 DF = 2. 21

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 9.4745 DF = 2. 23

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.0102 DF = 1. 23

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)

STAGE II DISSECTED (OUTER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 1000 SEC

TABLE 63

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	6	0.163544E+04	-.124281E+04	0.454860E+05	5	0.445415E+05	0.890831E+04	-.759926E+00
5R3	8	0.174200E+04	0.232000E+04	0.456100E+05	7	0.425102E+05	0.607269E+04	0.133180E+01
7AE	11	0.214425E+04	0.231500E+04	0.315670E+05	10	0.290676E+05	0.290676E+04	0.107963E+01
WITHIN	25	0.552169E+04	0.339219E+04	0.122653E+06	24	0.120569E+06	0.502371E+04	0.614338E+00
AMONG	2	0.137156E+04	0.180638E+05	0.530990E+06	1	0.293085E+06	0.293085E+06	
TOTAL	27	0.689325E+04	0.214560E+05	0.653643E+06	26	0.586859E+06	0.225715E+05	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.4215 DF = 2. 22
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 46.4089 DF = 2. 24
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.4148 DF = 1. 24

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 10 SEC

TABLE 64

ANALYSIS OF COVARIANCE TABLE

		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
135	6	0.163544E+04	-.557125E+03	0.358860E+05	5	0.356962E+05	0.713924E+04	-.3406561E+00
583	8	0.174200E+04	0.153337E+04	0.518722E+05	7	0.504725E+05	0.721036E+04	0.6802361E+00
768	11	0.214425E+04	-.220000E+03	0.272000E+05	10	0.271774E+05	0.271774E+04	-.1025999E+00
WITHIN	25	0.552169E+04	0.756250E+03	0.114908E+06	24	0.114805E+06	0.478353E+04	0.1369599E+00
AMONG	2	0.137156E+04	0.142237E+05	0.332064E+06	1	0.184557E+06	0.184557E+06	
TOTAL	27	0.689325E+04	0.149800E+05	0.446972E+06	26	0.414418E+06	0.159392E+05	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.1415 DF = 2. 22
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 31.3172 DF = 2. 24
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.0217 DF = 1. 24

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 50 SEC

TABLE 65

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
135	6	0.163544E+04	-.874250E+03	0.307930E+05	5	0.302756E+05	0.605513E+04	-.534566E+00
582	8	0.174200E+04	0.101337E+04	0.431556E+05	7	0.325660E+05	0.465229E+04	0.581730E+00
788	11	0.214425E+04	-.275000E+03	0.257000E+05	10	0.256647E+05	0.256647E+04	-.128249E+00
WITHIN	25	0.552169E+04	-.135875E+03	0.895986E+05	24	0.895952E+05	0.373313E+04	-.2460751E-01
AMONG	2	0.137156E+04	0.131669E+05	0.288287E+06	1	0.161887E+06	0.161887E+06	
TOTAL	27	0.689325E+04	0.130310E+05	0.377886E+06	26	0.353252E+06	0.135866E+05	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.1353 DF = 2. 22
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 35.3131 DF = 2. 24
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.0009 DF = 1. 24

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)
STAGE I1 DISSECTED (INNER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 100 SEC

TABLE 66

ANALYSIS OF COVARIANCE TABLE

		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
135	6	0.163544E+04	-.188562E+03	0.229720E+05	5	0.229503E+05	0.459005E+04	-.115297E+00
583	8	0.179200E+04	0.226687E+03	0.366222E+05	7	0.365927E+05	0.522754E+04	0.130130E+00
788	11	0.214425E+04	-.595000E+03	0.171687E+05	10	0.170016E+05	0.170016E+04	-.277486E+00
WITHIN	25	0.552169E+04	-.556875E+03	0.767809E+05	24	0.767047E+05	0.319603E+04	-.100852E+00
AMONG	2	0.137156E+04	0.102221E+05	0.163282E+06	1	0.870985E+05	0.870985E+05	
TOTAL	27	0.689325E+04	0.966519E+04	0.240063E+06	26	0.226491E+06	0.871120E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.0230 DF = 2. 22
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 23.4332 DF = 2. 24
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.0176 DF = 1. 24

STRESS RELAXATION ** ANALYSIS OF COVARIANCE ** (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) 77 DEG F. AND 0.5% STRAIN (NON-ORNTED) 1000 SEC

TABLE 67

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	49	0.143022E+05	-.172237E+04	0.384500E+03	48	0.177079E+03	0.368915E+01	-.120427E+00
583	49	0.232734E+05	-.764750E+03	0.194937E+03	48	0.169608E+03	0.353767E+01	-.328594E-01
748	49	0.144452E+05	-.728500E+03	0.118875E+03	48	0.821354E+02	0.171115E+01	-.504318E-01
WITHIN	147	0.520208E+05	-.321562E+04	0.698312E+03	146	0.499541E+03	0.342152E+01	-.618142E-01
AMONG	2	0.466119E+04	0.784625E+03	0.263187E+03	1	0.131110E+03	0.131110E+03	
TOTAL	149	0.568820E+05	-.243100E+04	0.961500E+03	148	0.857256E+03	0.579215E+01	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 11.8347 DF = 2. 144

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 52.2717 DF = 2. 146

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 58.0945 DF = 1. 146

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)

STAGE II DISSECTED (OUTER) HARDNESS SHORE-A AT 10 SEC. (77 DEG F.)

TABLE 68

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
135	49	0.143022E+05	-.119587E+04	0.363562E+03	48	0.263570E+03	0.549103E+01	-.6361483E-01
583	57	0.277697E+05	0.158462E+04	0.688250E+03	56	0.797826E+03	0.142469E+02	0.5706294E-01
78E	49	0.144452E+05	-.169312E+03	0.411162E+03	48	0.409578E+03	0.853287E+01	-.1172094E-01
WITHIN	155	0.565172E+05	0.219437E+03	0.166337E+04	154	0.166252E+04	0.107956E+02	0.3882660E-02
AMONG	2	0.473281E+04	0.259556E+04	0.266725E+04	1	0.124380E+04	0.124380E+04	
TOTAL	157	0.612500E+05	0.281500E+04	0.433062E+04	156	0.420125E+04	0.269311E+02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 9.8967 DF = 2, 152
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 117.5814 DF = 2, 154
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.0789 DF = 1, 154

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) HARDNESS SHORE-A AT 10 SEC. (77 DEG F.)

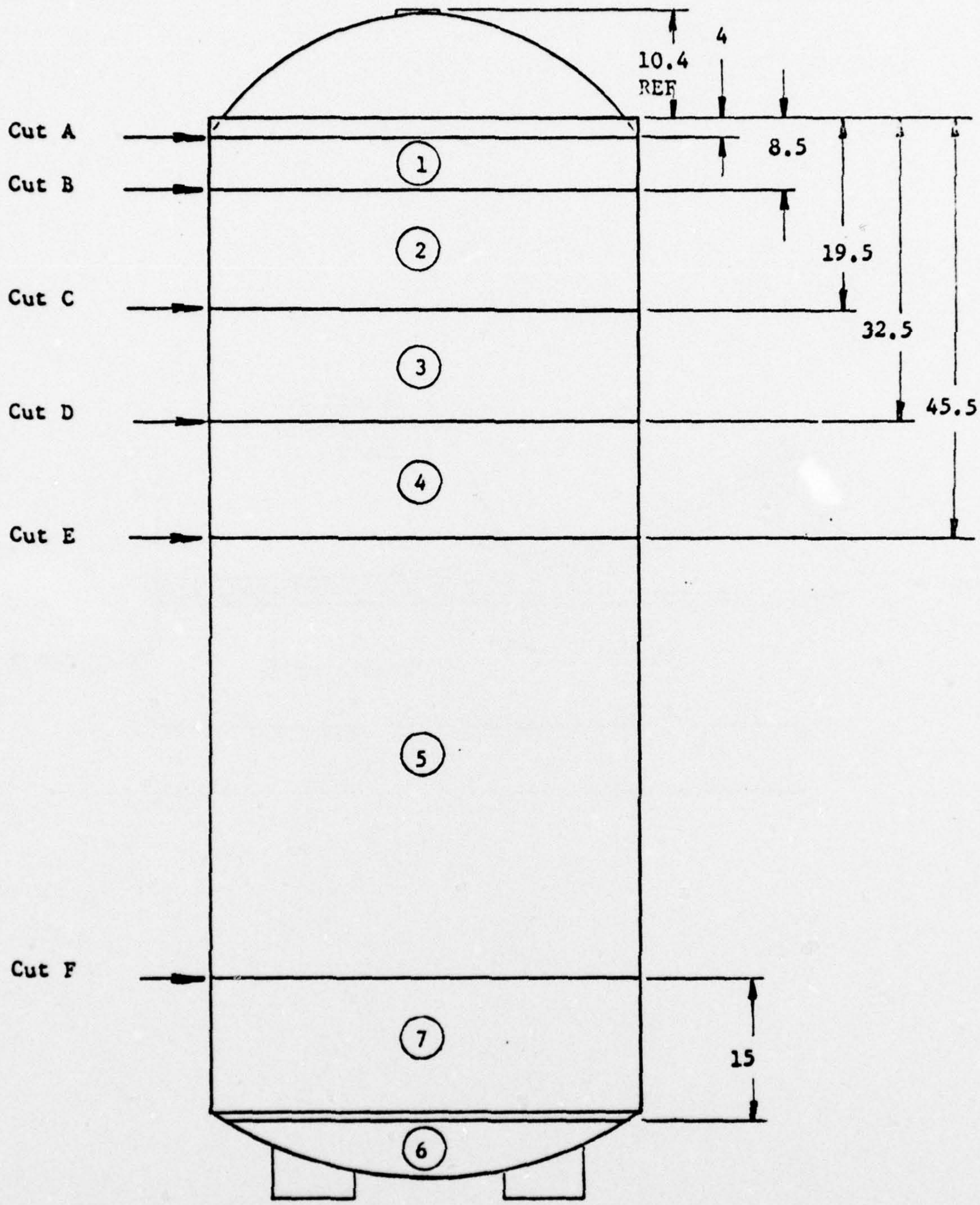


Figure 1 Dissection layout of Cuts, Locations and Section Numbers

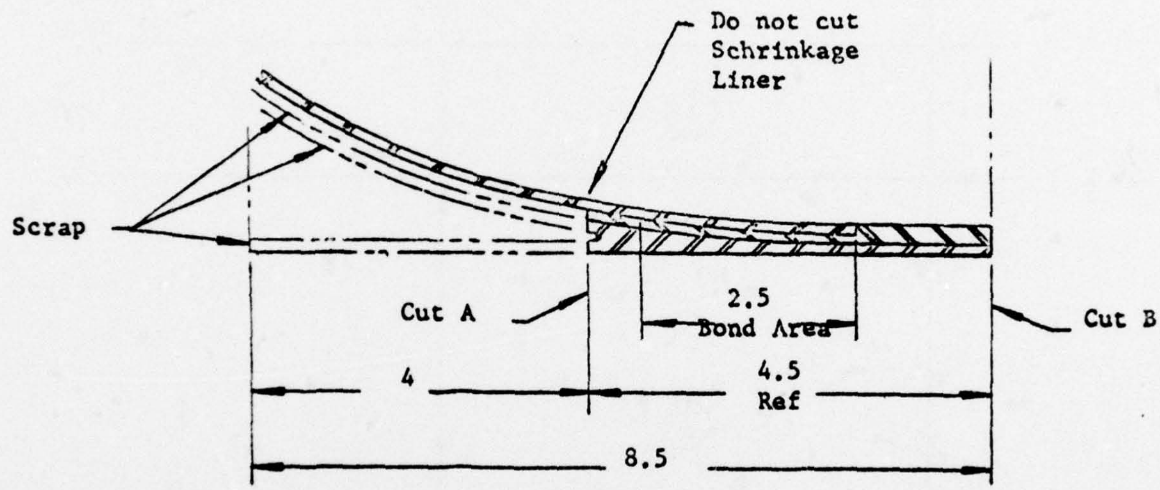


Figure 2 Dissection Detail of Cuts A and B

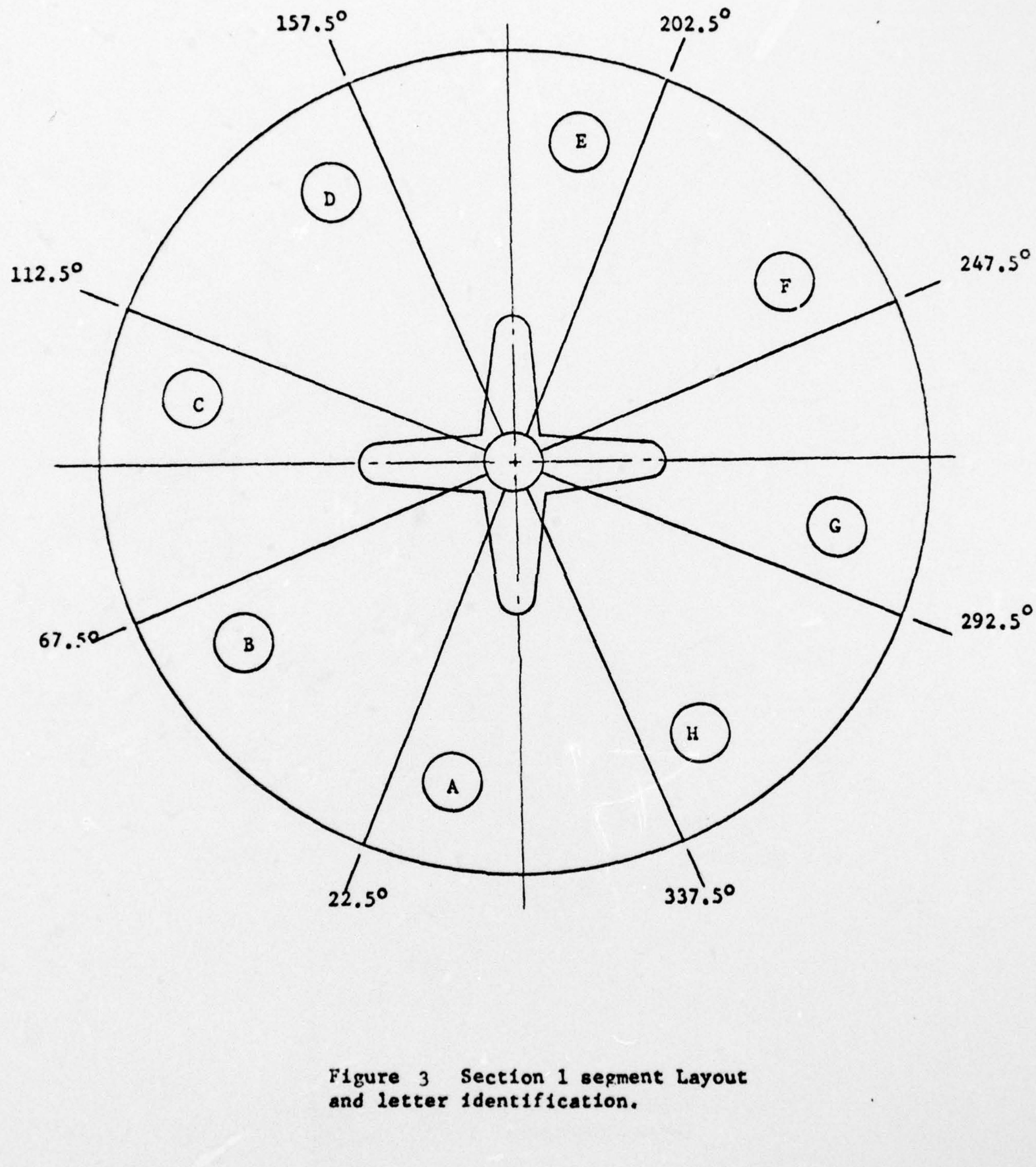


Figure 3 Section 1 segment Layout and letter identification.

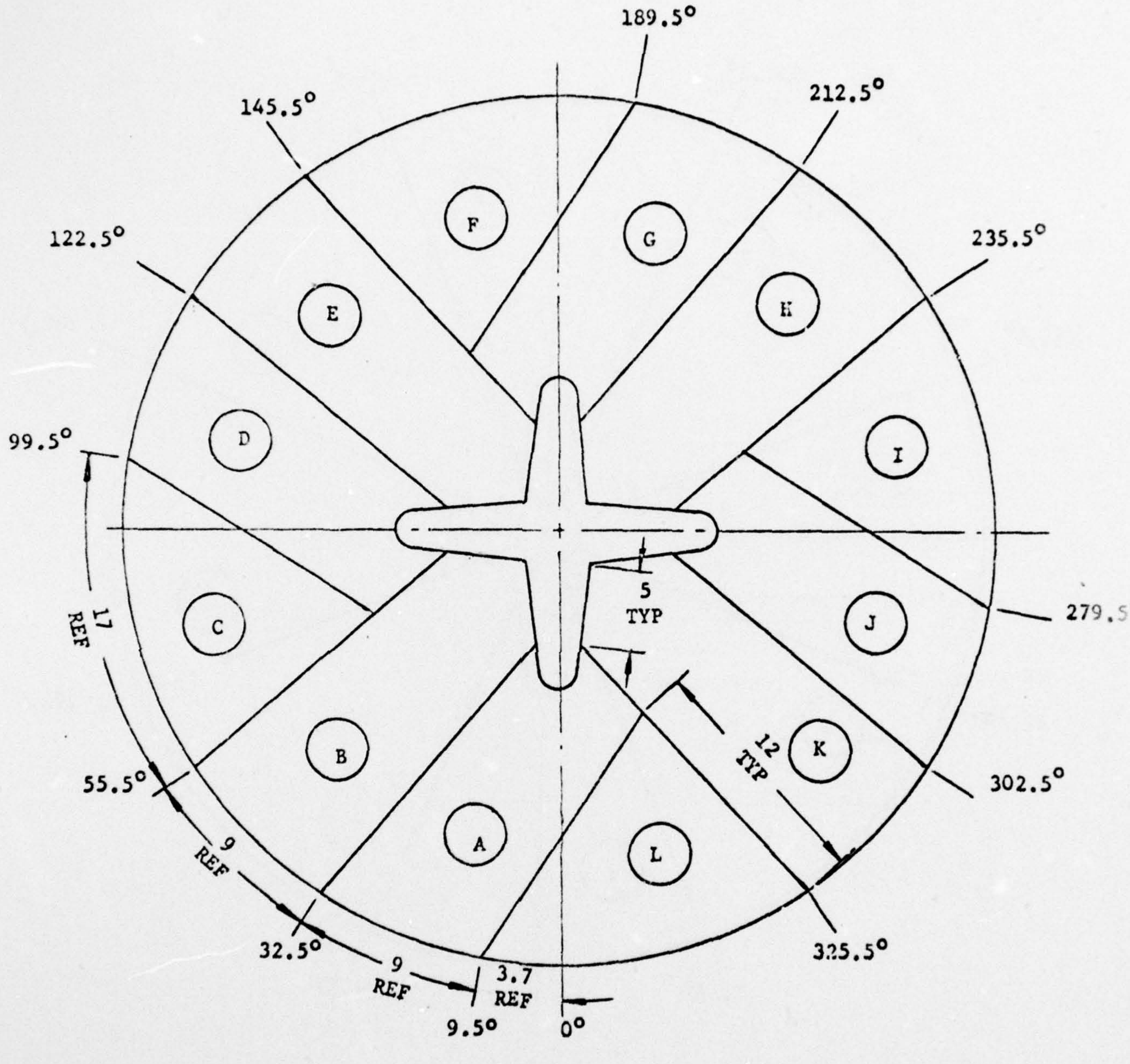


Figure 4 Section 3 and 4 Segment
Layout and Letter Identification

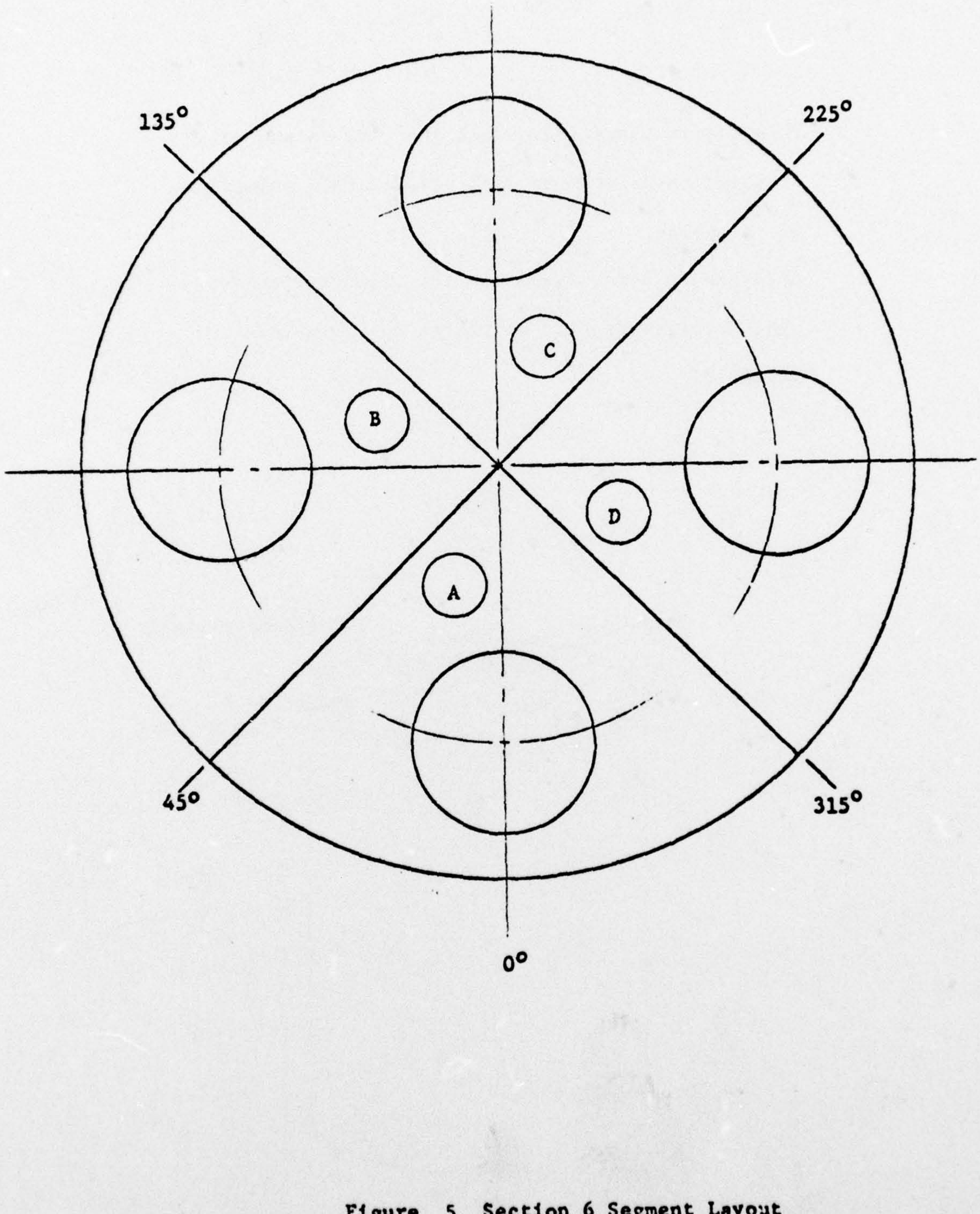


Figure 5 Section 6 Segment Layout and Letter Identification

This figure illustrates what the various sample orientation terms mean with respect to a segment of the motor.

A JANNAF dogbone is used in the illustration to depict the areas from where the specimens are obtained.

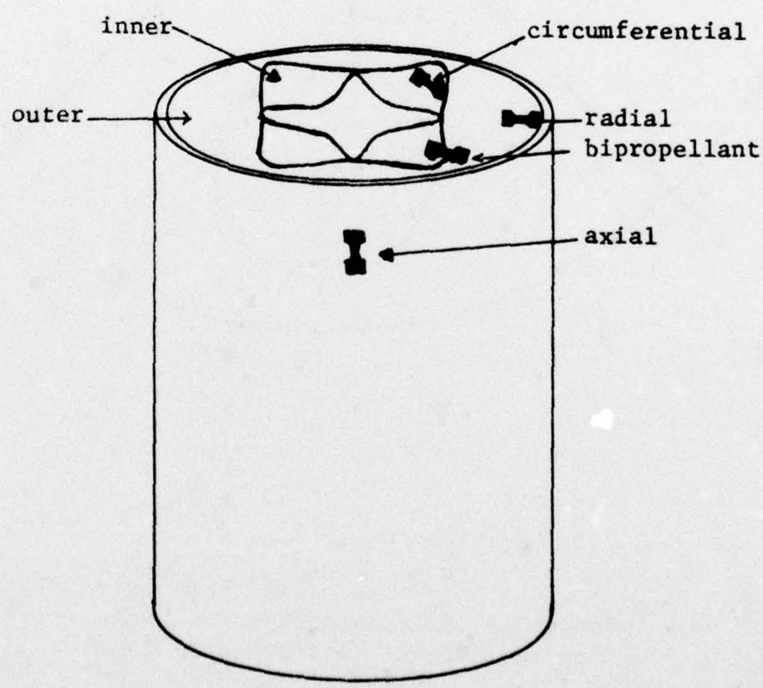


FIGURE 6

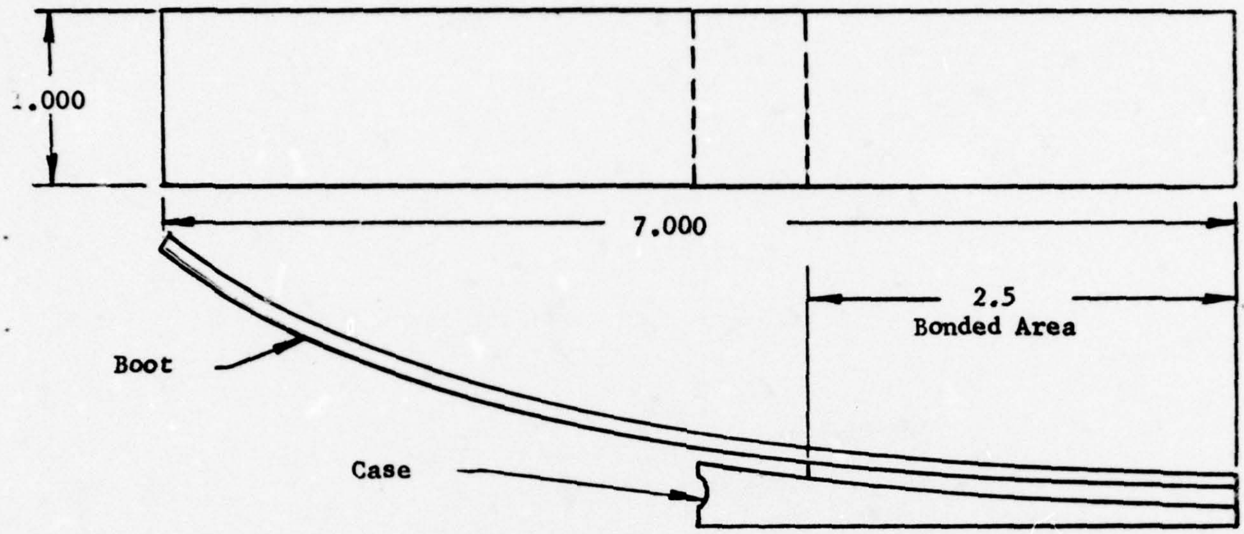


FIGURE 7 GARLOCK 7765 FORWARD RELEASE PEEL SPECIMEN

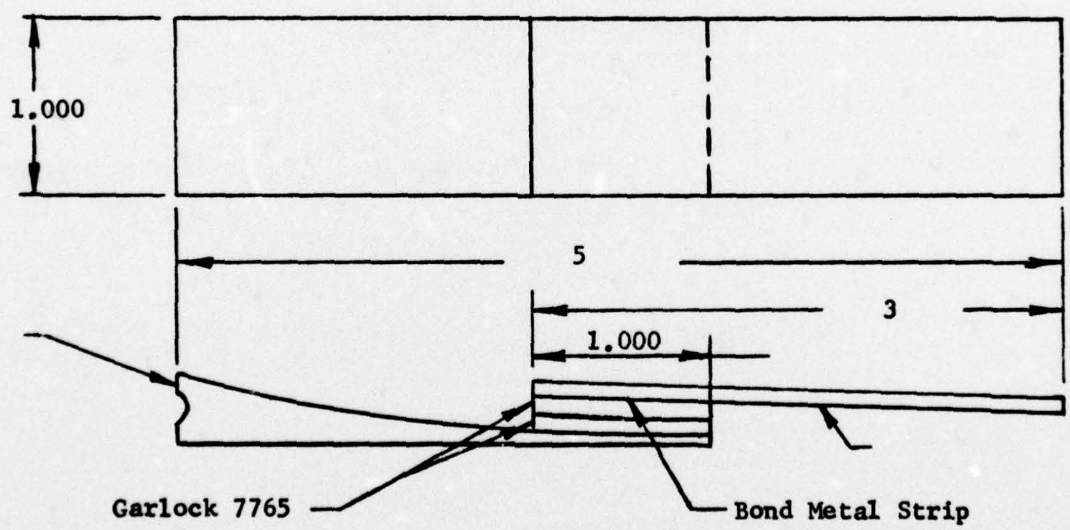


FIGURE 8 GARLOCK 7765 FORWARD RELEASE SHEAR SPECIMEN

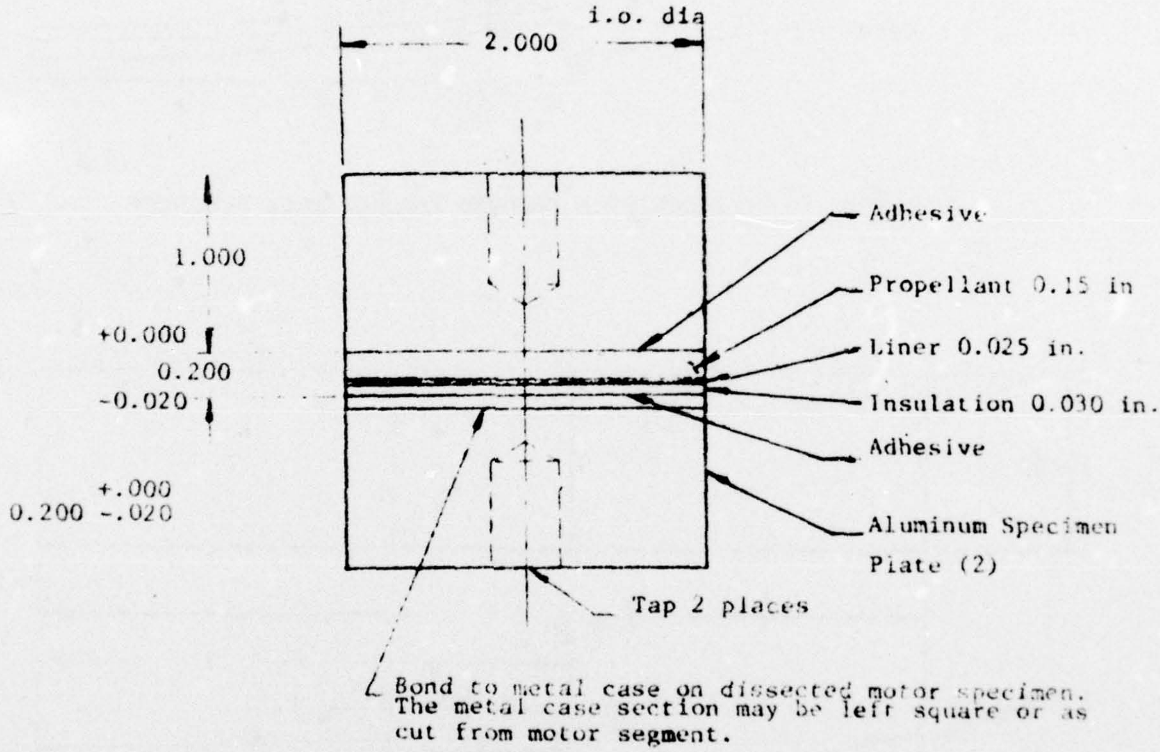


Figure 9 Bond Shear Specimen (Propellant/Liner/Insulation)

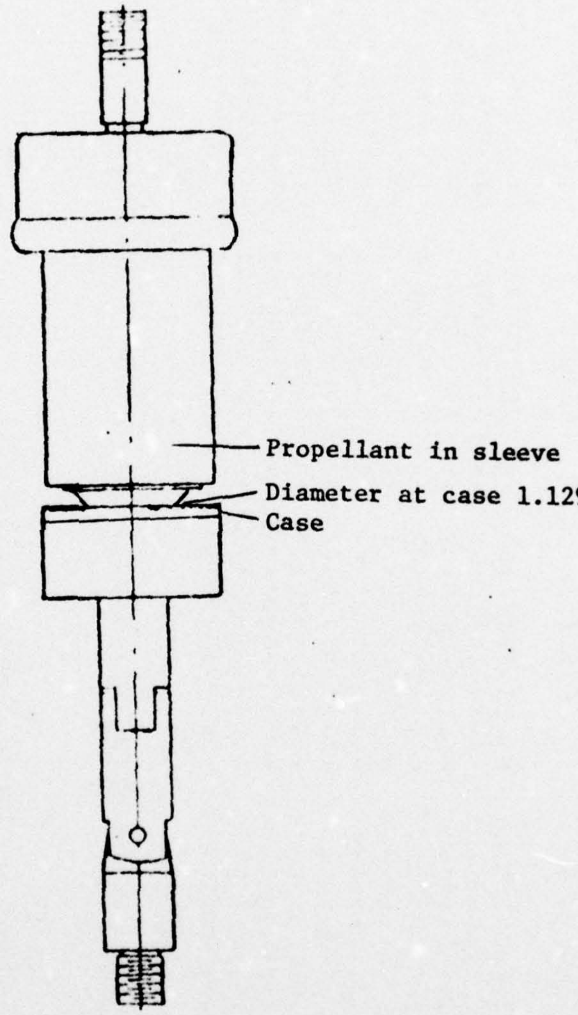


Figure 10. Sleeved Bond Specimen (for Bond Tensile Test)
(Propellant/Liner/Insulation/Case)

NOTE: Case may be left as cut from motor

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
93.0	8	+4.2762451E+01	+3.5542222E+00	+4.9399993E+01	+3.7399993E+01	+4.3124938E+01
100.0	8	+4.0774963E+01	+3.3464430E+00	+4.5699996E+01	+3.7299987E+01	+4.3198333E+01
113.0	3	+4.5162445E+01	+1.1918040E+00	+4.6799987E+01	+4.3399993E+01	+4.4152450E+01
116.0	4	+4.6349990E+01	+2.0461049E+00	+4.9319992E+01	+4.4789993E+01	+4.4372634E+01
122.0	4	+5.0449981E+01	+4.2285529E-01	+5.0979995E+01	+5.0049987E+01	+4.4813003E+01
129.0	4	+4.2197479E+01	+5.4060730E-01	+4.2939987E+01	+4.1739990E+01	+4.5326766E+01
130.0	3	+5.0593322E+01	+2.0044173E+00	+5.2309997E+01	+4.8389999E+01	+4.5400161E+01
136.0	3	+4.3469985E+01	+1.6813467E+00	+4.5409988E+01	+4.2429992E+01	+4.5840530E+01
144.0	3	+4.0719985E+01	+2.2230638E+00	+4.2250000E+01	+3.8169998E+01	+4.6427688E+01
149.0	3	+5.2136657E+01	+1.6726968E+00	+5.4039993E+01	+5.0899993E+01	+4.6794647E+01
155.0	3	+4.3533325E+01	+6.2732610E-01	+4.4099990E+01	+4.2859985E+01	+4.7235015E+01

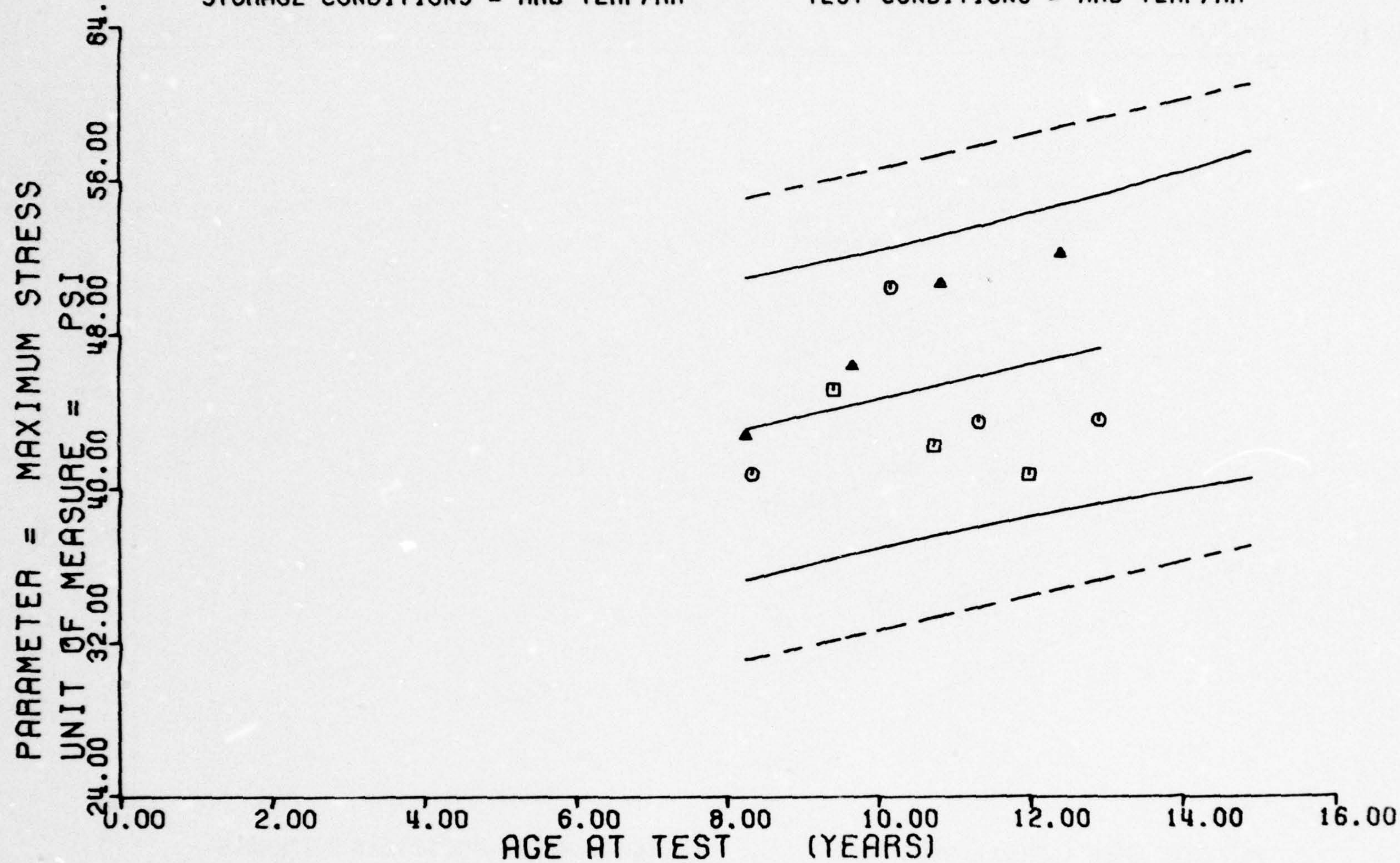
II STAGE DSCT MTRS.OUTER.AXIAL PCS,V.L.RATE CHS=0.0002 IN/MIN,MAXIMUM STRESS

This sample size summary applies to Figures 11, 12 and 13

Y = ((+3.5858909E+01) + (+7.3394306E-02) * X)

F = +5.5816581E+00	SIGNIFICANCE OF F = SIGNIFICANT	σ_Y = +4.1710684E+00
R = +3.1978512E-01	SIGNIFICANCE OF R = SIGNIFICANT	S_B = +3.1065672E-02
t = +2.3625533E+00	SIGNIFICANCE OF t = SIGNIFICANT	S_E = +3.9921693E+00
N = 51	DEGREES OF FREEDOM = 49	

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL POS. V.L. RATE CHS=0.0002 IN/MIN, MAXIMUM STRESS

Figure 11

Y = ((+3.1624359E-01) + (-9.2077029E-04) * X)

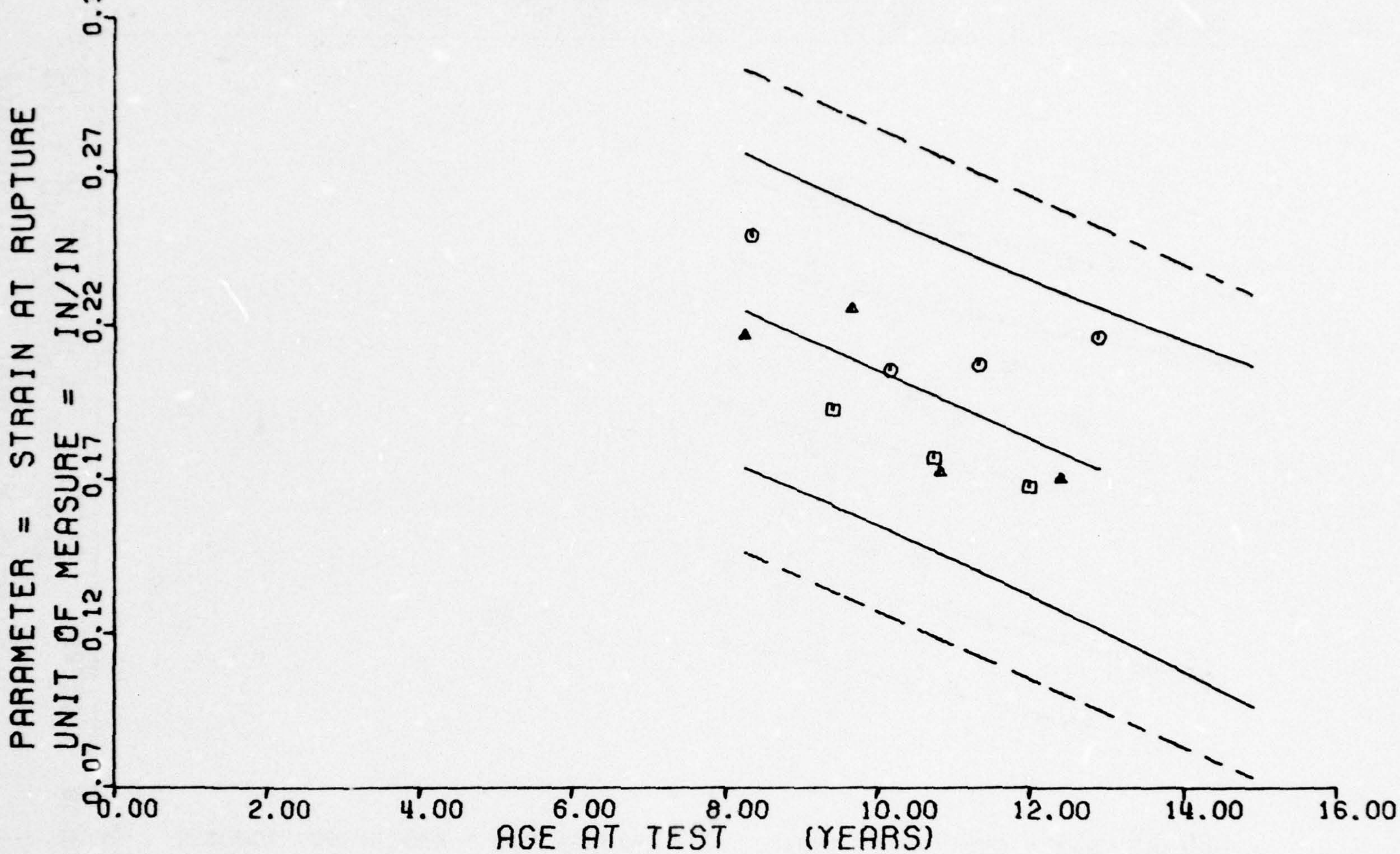
F = +2.0493166E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_1 = +3.0814918E-02

R = -5.4304207E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +2.0339804E-04

t = +4.5269378E+00 SIGNIFICANCE OF t = SIGNIFICANT S_y = +2.6138157E-02

N = 51 DEGREES OF FREEDOM = 49

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, STRAIN/RUPTURE

Figure 12

Y = ((+2.6517136E+02) + (+9.4321330E-01) * X)

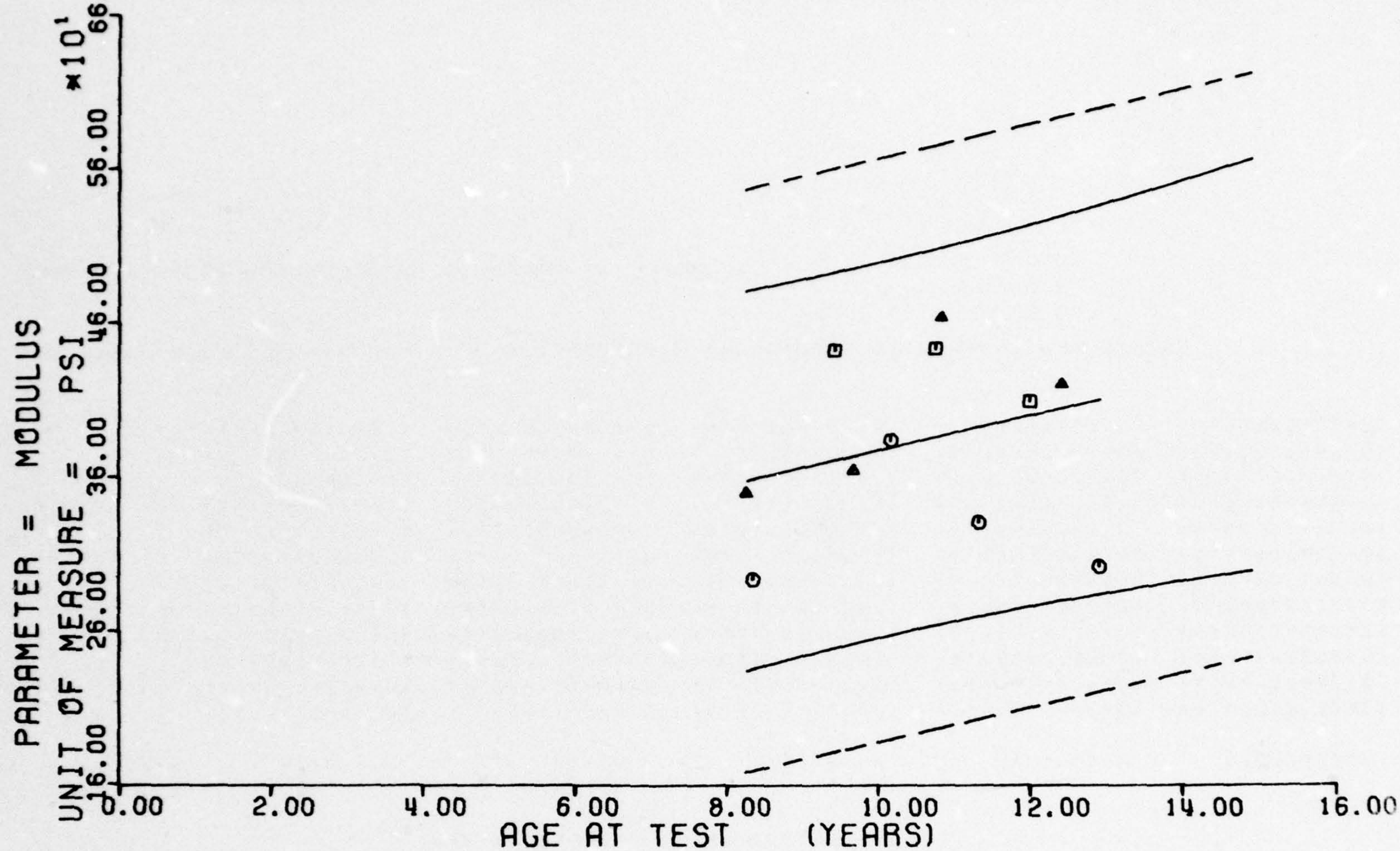
F = +3.6738101E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +6.4907088E+01

R = +2.6409549E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +4.9209795E-01

t = +1.9167185E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +6.3238238E+01

N = 51 DEGREES OF FREEDOM = 49

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, MODULUS

Figure 13

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	8	+3.9387481E+01	+3.0578165E+00	+4.3699996E+01	+3.4500000E+01	+4.5701217E+01
100.0	8	+4.4862457E+01	+2.4900618E+00	+4.9199996E+01	+4.2199996E+01	+4.5807464E+01
113.0	8	+5.0862457E+01	+1.8205457E+00	+5.3299987E+01	+4.7399993E+01	+4.7188629E+01
116.0	4	+5.2304992E+01	+1.6258999E+00	+5.3669998E+01	+5.0169998E+01	+4.7507354E+01
122.0	4	+4.7742492E+01	+1.3312639E+00	+4.9149993E+01	+4.5989990E+01	+4.8144821E+01
129.0	4	+6.6812438E+01	+9.5834571E-01	+6.8219985E+01	+6.6209991E+01	+4.8885519E+01
130.0	3	+4.2466659E+01	+1.8430976E+00	+4.3759994E+01	+4.0359985E+01	+4.8954766E+01
136.0	3	+4.3333328E+01	+1.5909934E+00	+4.5169998E+01	+4.2369995E+01	+4.9632217E+01
144.0	3	+5.4736648E+01	+2.5840596E+00	+5.7119995E+01	+5.1989990E+01	+5.0482162E+01
149.0	3	+4.6369995E+01	+4.1714919E+00	+5.0309997E+01	+4.2000000E+01	+5.1013381E+01
155.0	3	+5.6206649E+01	+1.1194667E+01	+6.3279998E+01	+4.3299987E+01	+5.1650848E+01
162.0	4	+4.3739990E+01	+1.3729968E+00	+4.5019989E+01	+4.2379959E+01	+5.2394546E+01

II STAGE DSCT MIRS,INNER,AXIAL FCS,V.L.RATE CHS=0.0002 IN/MIN,MAXIMUM STRESS

This sample size summary applies to Figures 14, 15 and 16

Y = ((+3.5183137E+01) + (+1.0624332E-01) * X)

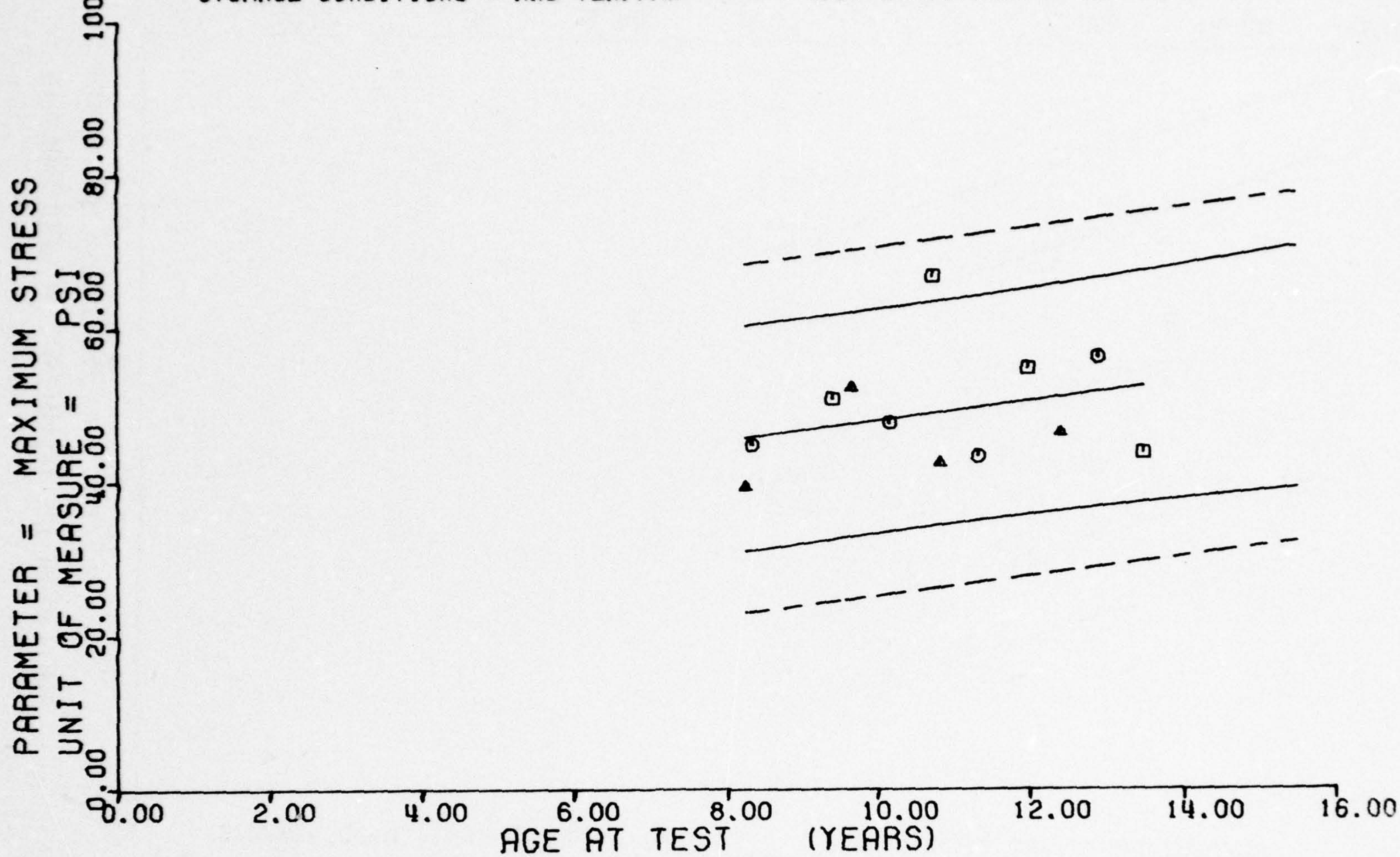
F = +4.6091159E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +7.7758792E+00

R = +2.8285457E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +4.9487194E-02

t = +2.1468851E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +7.5283669E+00

N = 55 DEGREES OF FREEDOM = 53

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



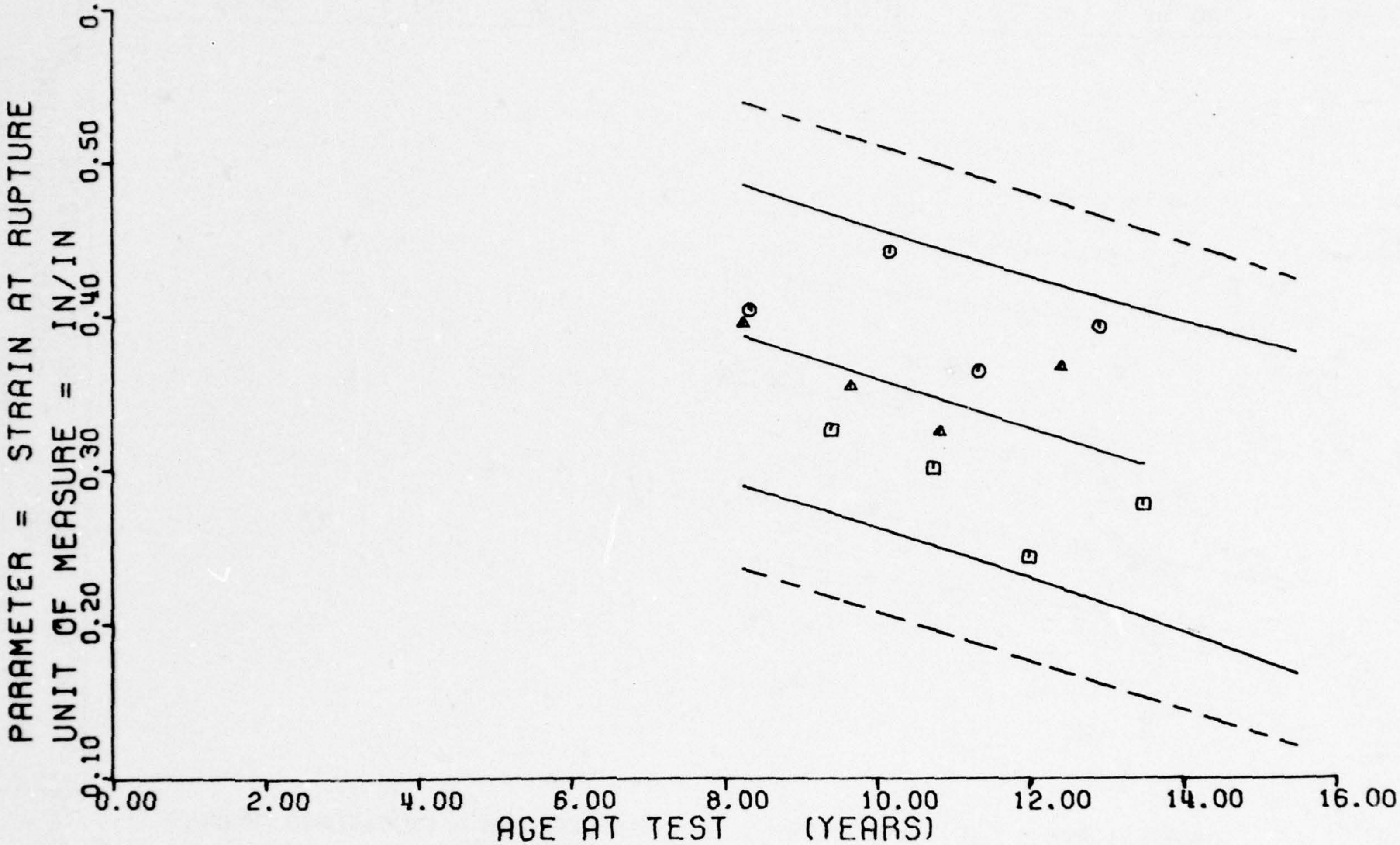
II STAGE OSCT MTRS, INNER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, MAXIMUM STRESS

Figure 14

Y = ((+5.2064424E-01) + (-1.3406623E-03) * X)

F = +1.6244817E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +5.7301592E-02
R = -4.8435499E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +3.3263043E-04
t = +4.0304860E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +5.0602261E-02
N = 55 DEGREES OF FREEDOM = 53

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



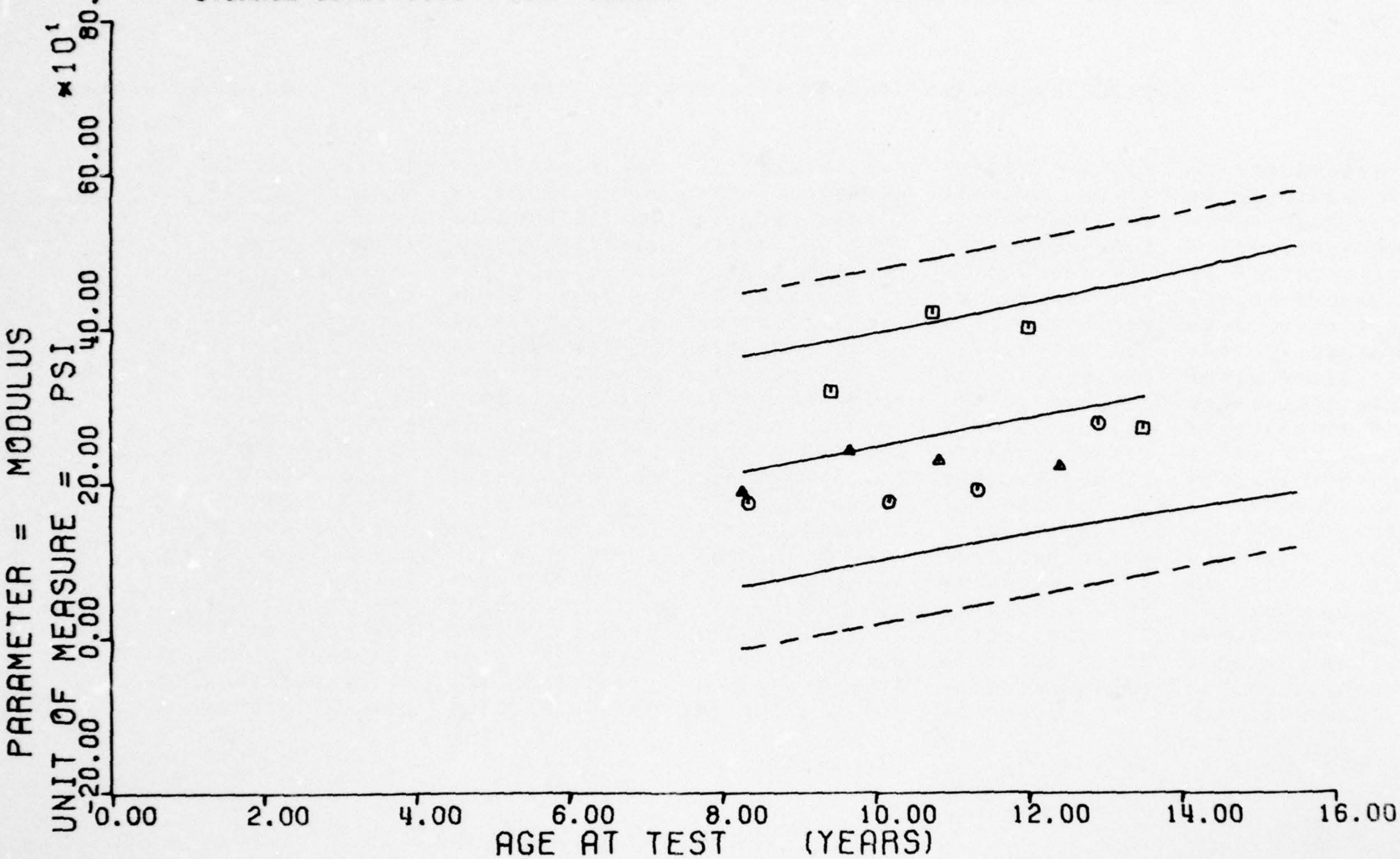
II STAGE DSCT MTRS.INNER.AXIAL POS.V.L.RATE CHS=0.0002 IN/MIN.STRAIN/RUPTURE

Figure 15

Y = ((+6.9508656E+01) + (+1.4872703E+00) * X)

F = +8.7460829E+00   SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +8.1808588E+01
R = +3.7635881E-01   SIGNIFICANCE OF R = SIGNIFICANT S_a = +5.0290172E-01
t = +2.9573777E+00   SIGNIFICANCE OF t = SIGNIFICANT S_E = +7.6505220E+01
N = 55   DEGREES OF FREEDOM = 53

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS.INNER.AXIAL POS.V.L.RATE CHS=0.0002 IN/MIN. MODULUS

Figure 16

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
20.0	1	+1.0000000E+02	+0.0000000E+55	+1.0000000E+02	+1.0000000E+02	+1.0116358E+02
27.0	1	+9.1799987E+01	+0.0000000E+59	+9.1799987E+01	+9.1799987E+01	+1.0227017E+02
36.0	1	+1.1500000E+02	+0.0000000E+63	+1.1500000E+02	+1.1500000E+02	+1.0369290E+02
43.0	1	+1.0700000E+02	+0.0000000E+67	+1.0700000E+02	+1.0700000E+02	+1.0479548E+02
57.0	2	+1.2050000E+02	+1.0606601E+01	+1.2800000E+02	+1.1300000E+02	+1.0701263E+02
64.0	2	+1.0650000E+02	+7.0710678E-01	+1.0700000E+02	+1.0600000E+02	+1.0811920E+02
73.0	3	+1.2033332E+02	+5.7735026E-01	+1.2100000E+02	+1.2000000E+02	+1.0954194E+02
84.0	3	+1.2466665E+02	+4.0414518E+00	+1.2700000E+02	+1.2000000E+02	+1.1128085E+02
90.0	3	+1.0933332E+02	+1.2423096E+01	+1.1700000E+02	+9.5000000E+01	+1.1222933E+02
100.0	16	+9.5937500E+01	+1.4172596E+01	+1.1500000E+02	+8.0000000E+01	+1.1381016E+02
102.0	3	+1.1833332E+02	+1.5275252E+00	+1.2000000E+02	+1.1700000E+02	+1.1412632E+02
113.0	8	+1.2962500E+02	+3.9256482E+00	+1.3500000E+02	+1.2300000E+02	+1.1586523E+02
116.0	4	+1.2783996E+02	+1.2918889E+00	+1.2962998E+02	+1.2666999E+02	+1.1618139E+02
120.0	3	+1.1400325E+02	+6.0584702E+00	+1.1750000E+02	+1.0700999E+02	+1.1697181E+02
122.0	4	+1.2726489E+02	+1.2461648E+00	+1.2857998E+02	+1.2614999E+02	+1.1728797E+02
129.0	4	+1.2971240E+02	+8.4571722E-01	+1.3075000E+02	+1.2903999E+02	+1.1839454E+02
131.0	3	+1.2301992E+02	+7.1236251E-01	+1.2377999E+02	+1.2240998E+02	+1.1871070E+02
137.0	3	+1.0322329E+02	+2.1904902E+00	+1.0519999E+02	+1.0086999E+02	+1.1965921E+02
143.0	4	+1.0432495E+02	+9.7243835E+00	+1.1617999E+02	+9.4009994E+01	+1.2060769E+02
143.0	3	+1.2969985E+02	+2.6765109E+00	+1.3144999E+02	+1.2662998E+02	+1.2139811E+02
155.0	3	+1.4210993E+02	+8.1255019E+00	+1.5122999E+02	+1.3562998E+02	+1.2250468E+02
161.0	3	+1.1301660E+02	+1.7623937E+00	+1.1472999E+02	+1.1121999E+02	+1.2345318E+02

II STAGE CTN & DSCT MTRS.OUTER.AXIAL PCS.LOW RATE CHS=2.0 IN/MIN.MAX STRESS

This sample size summary applies to Figures 17, 18 and 19

Y = ((+9.8001957E+01) + (+1.5808216E-01) * X)

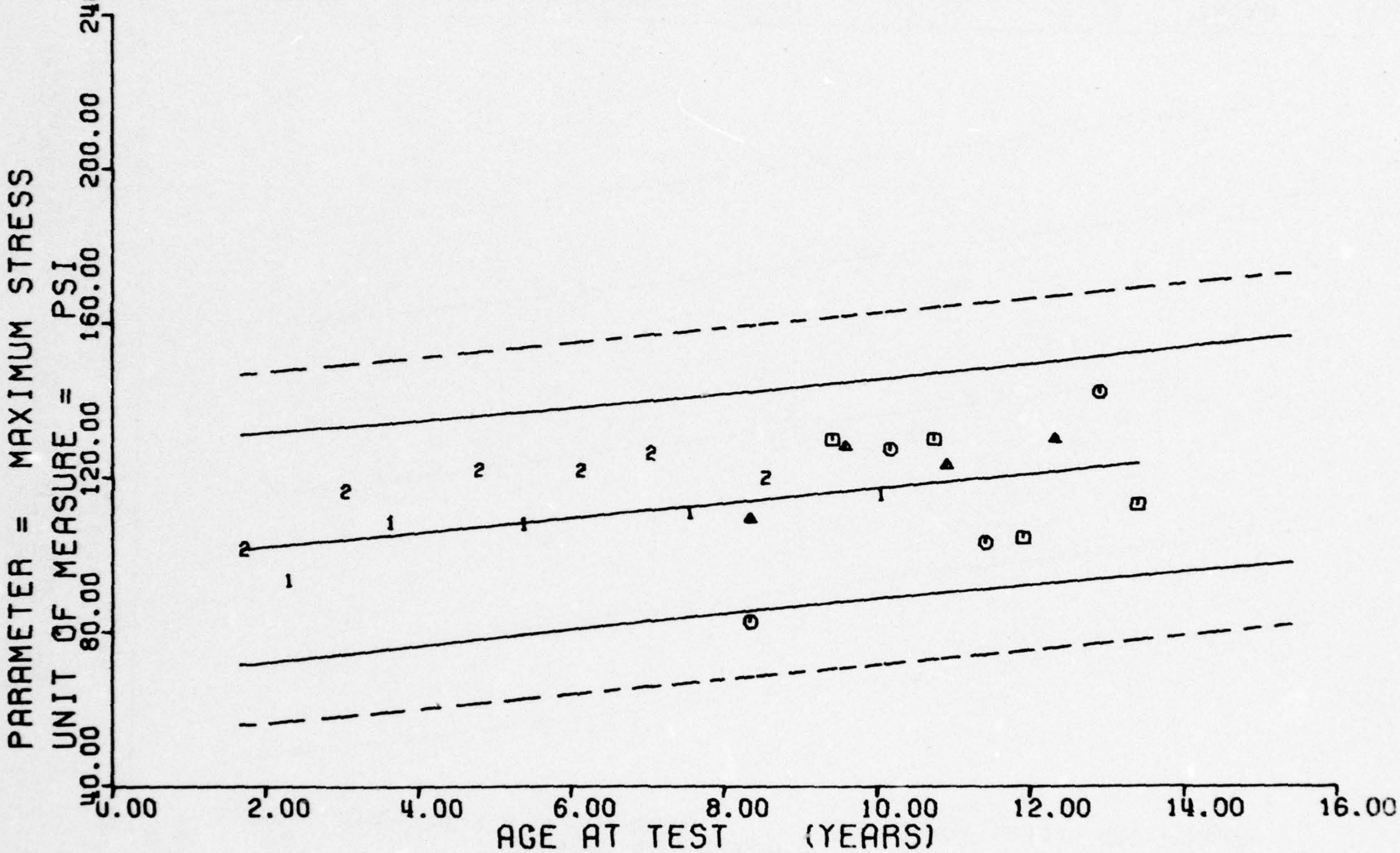
F = +7.9023581E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.5798990E+01

R = +3.0689603E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +5.6234716E-02

t = +2.8111133E+00 SIGNIFICANCE OF t = SIGNIFICANT S_e = +1.5135181E+01

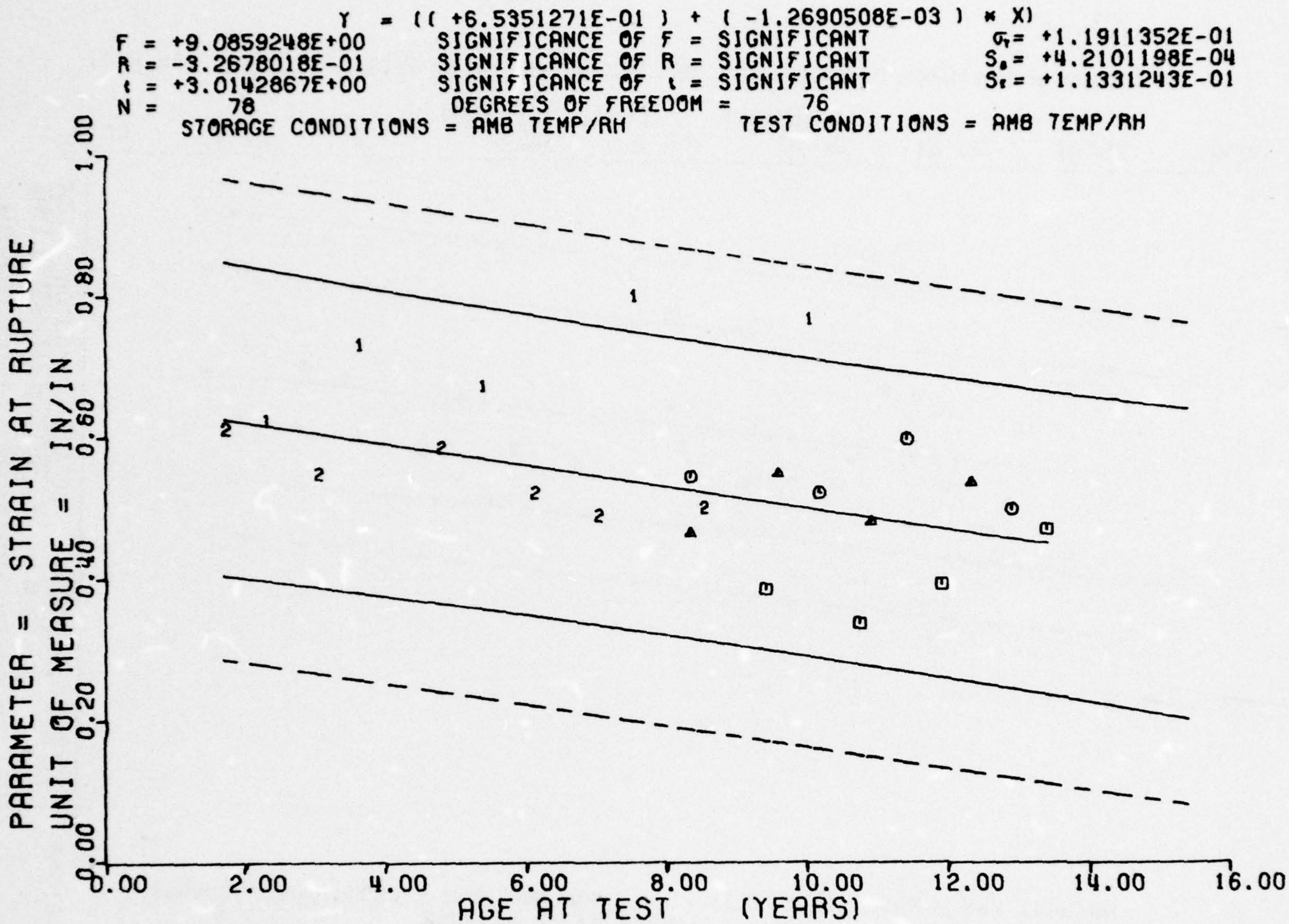
N = 78 DEGREES OF FREEDOM = 76

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE CTN & DSCT MTRS.OUTER.AXIAL POS.LOW RATE CHS=2.0 IN/MIN.MAX STRESS

Figure 17

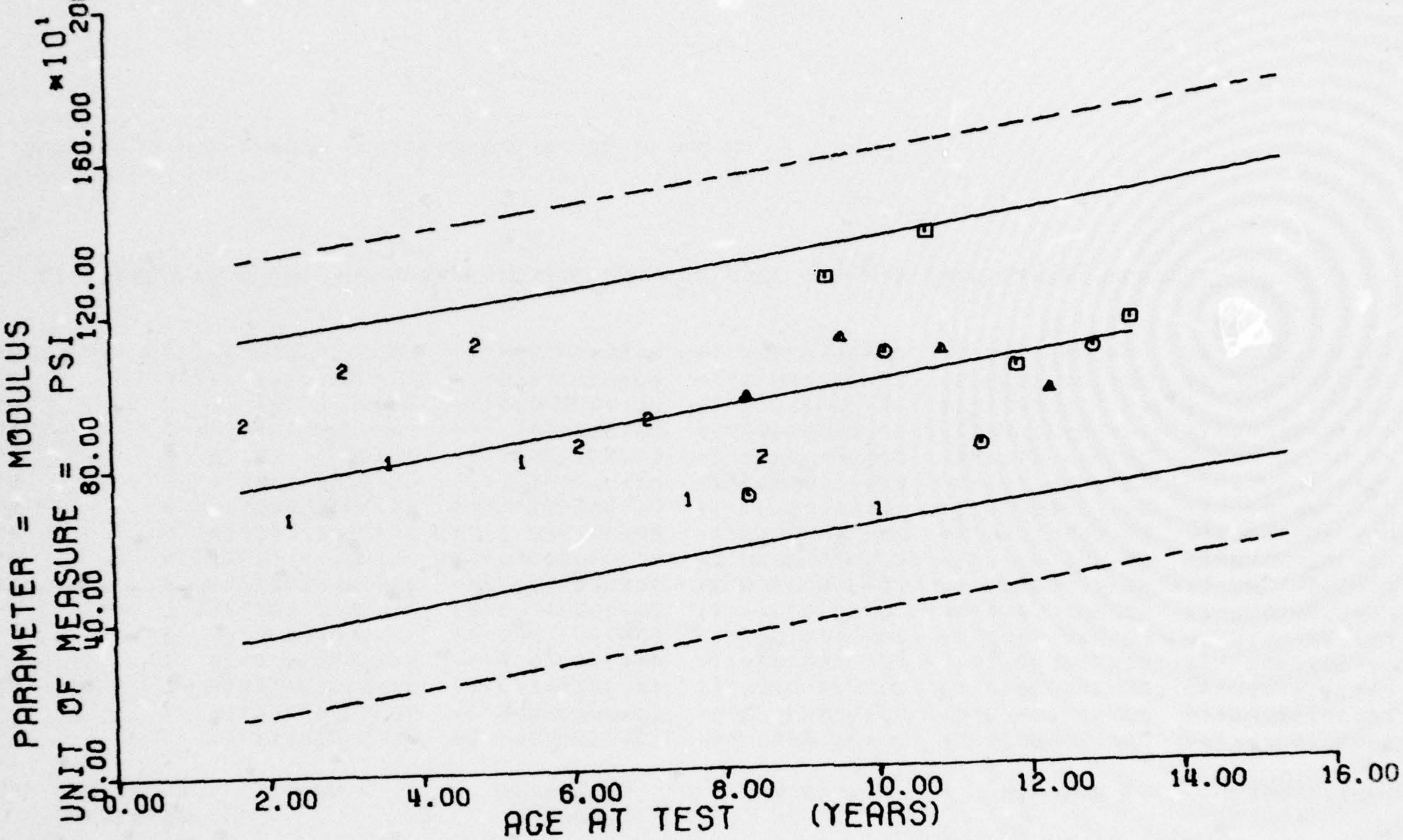


II STAGE CTN & DSCT MTRS, OUTER, AXIAL POS. LOW RATE CHS=2.0 IN/MIN, STRAIN/RUPTURE

Figure 18

Y = ((+6.9305048E+02) + (+2.5847799E+00) * X)

F = +1.2300719E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +2.1241158E+02
R = +3.7323566E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +7.3698445E-01
t = +3.5072381E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.9835421E+02
N = 78 DEGREES OF FREEDOM = 76
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE CTN & DSCT MTRS.OUTER.AXIAL POS.LOW RATE CHS=2.0 IN/MIN. MODULUS

Figure 19

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
20.0	1	+1.1309999E+02	+0.0000000E+59	+1.1309999E+02	+1.1309999E+02	+9.7472427E+01
36.0	1	+1.2300000E+02	+0.0000000E+63	+1.2300000E+02	+1.2300000E+02	+1.0236578E+02
57.0	2	+1.2150000E+02	+7.0710678E-01	+1.2200000E+02	+1.2100000E+02	+1.0878831E+02
84.0	3	+1.2766665E+02	+4.5092497E+00	+1.3200000E+02	+1.2300000E+02	+1.1704585E+02
100.0	12	+9.6083328E+01	+8.6598166E+00	+1.1100000E+02	+8.8000000E+01	+1.2193922E+02
101.0	3	+1.1533332E+02	+2.0816659E+00	+1.1700000E+02	+1.1300000E+02	+1.2224505E+02
113.0	8	+1.5362500E+02	+3.6620642E+00	+1.5900000E+02	+1.5000000E+02	+1.2591506E+02
115.0	4	+1.2376245E+02	+1.8403804E+00	+1.2607998E+02	+1.2173999E+02	+1.2652674E+02
122.0	4	+1.2032745E+02	+1.2474978E+00	+1.2186999E+02	+1.1891999E+02	+1.2866758E+02
129.0	4	+1.6060485E+02	+1.6142939E+00	+1.6275999E+02	+1.5900999E+02	+1.3080842E+02
131.0	3	+1.1671997E+02	+2.2014737E+00	+1.1891999E+02	+1.1451998E+02	+1.3142010E+02
137.0	3	+1.2369995E+02	+1.3552253E+00	+1.2475999E+02	+1.2217999E+02	+1.3325511E+02
144.0	3	+1.4483657E+02	+1.7027619E+00	+1.4675999E+02	+1.4356999E+02	+1.3539595E+02
148.0	3	+1.1721328E+02	+4.1233268E+00	+1.2109999E+02	+1.1288999E+02	+1.3661929E+02
154.0	3	+1.3520996E+02	+3.8992797E+00	+1.3795999E+02	+1.3075000E+02	+1.3845429E+02
161.0	3	+1.5839656E+02	+6.1652806E+00	+1.6356999E+02	+1.5157998E+02	+1.4059515E+02

II STAGE CTN & DSCT MTRS.INNER.AXIAL POS.LOW RATE CHS=2.0 IN/MIN.MAX STRESS

This sample size summary applies to Figures 20, 21 and 22

Y = ((+9.1355732E+01) + (+3.0583493E-01) * X)

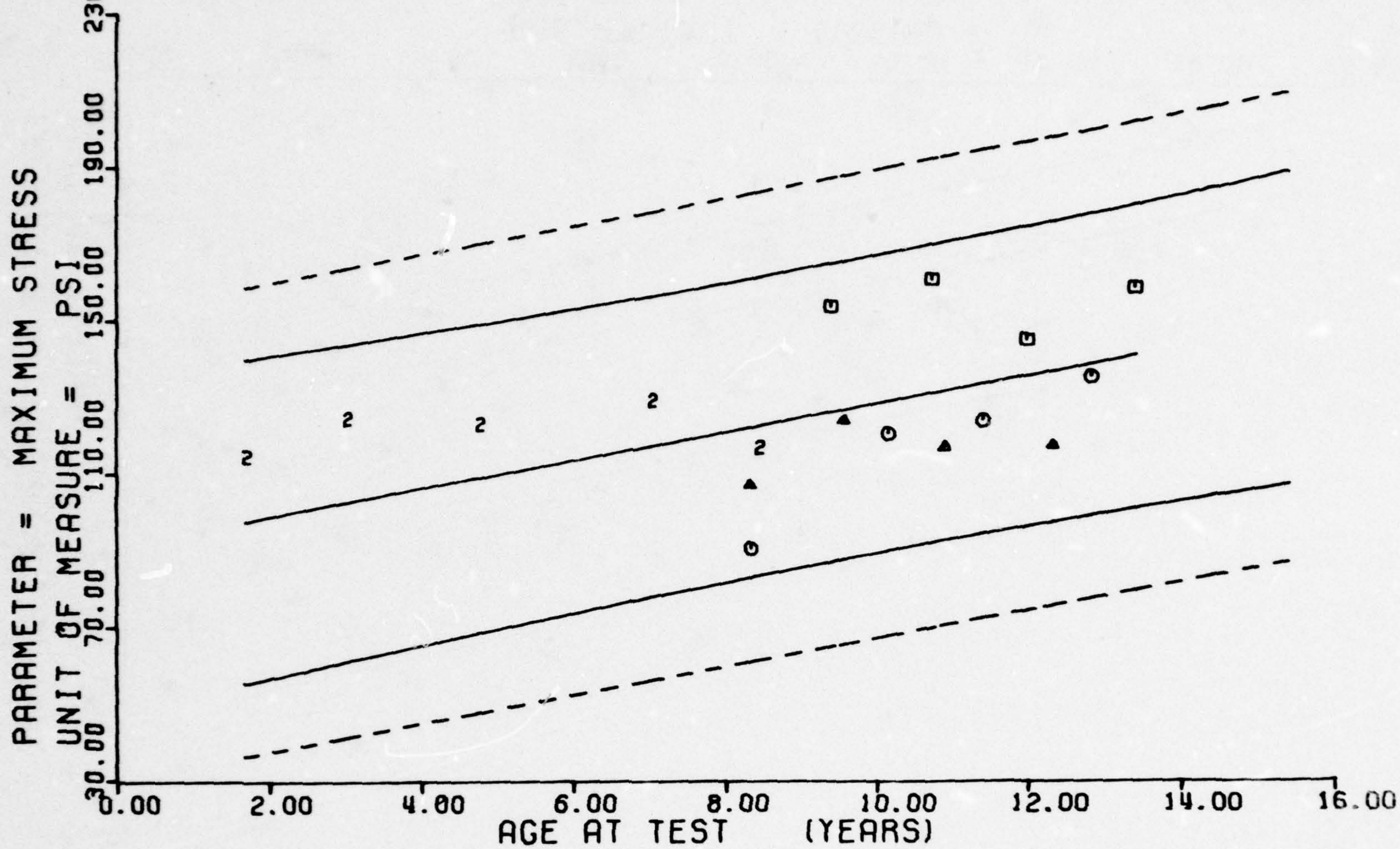
F = +1.0892757E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_1 = +2.1959279E+01

R = +3.9763273E-01 SIGNIFICANCE OF R = SIGNIFICANT S_β = +9.2665521E-02

t = +3.3004177E+00 SIGNIFICANCE OF t = SIGNIFICANT S_ϵ = +2.0321572E+01

N = 60 DEGREES OF FREEDOM = 58

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE CTM & DSCT MTRS, INNER AXIAL POS. LOW RATE CHS=2.0 IN/MIN, MAX STRESS

Figure 20

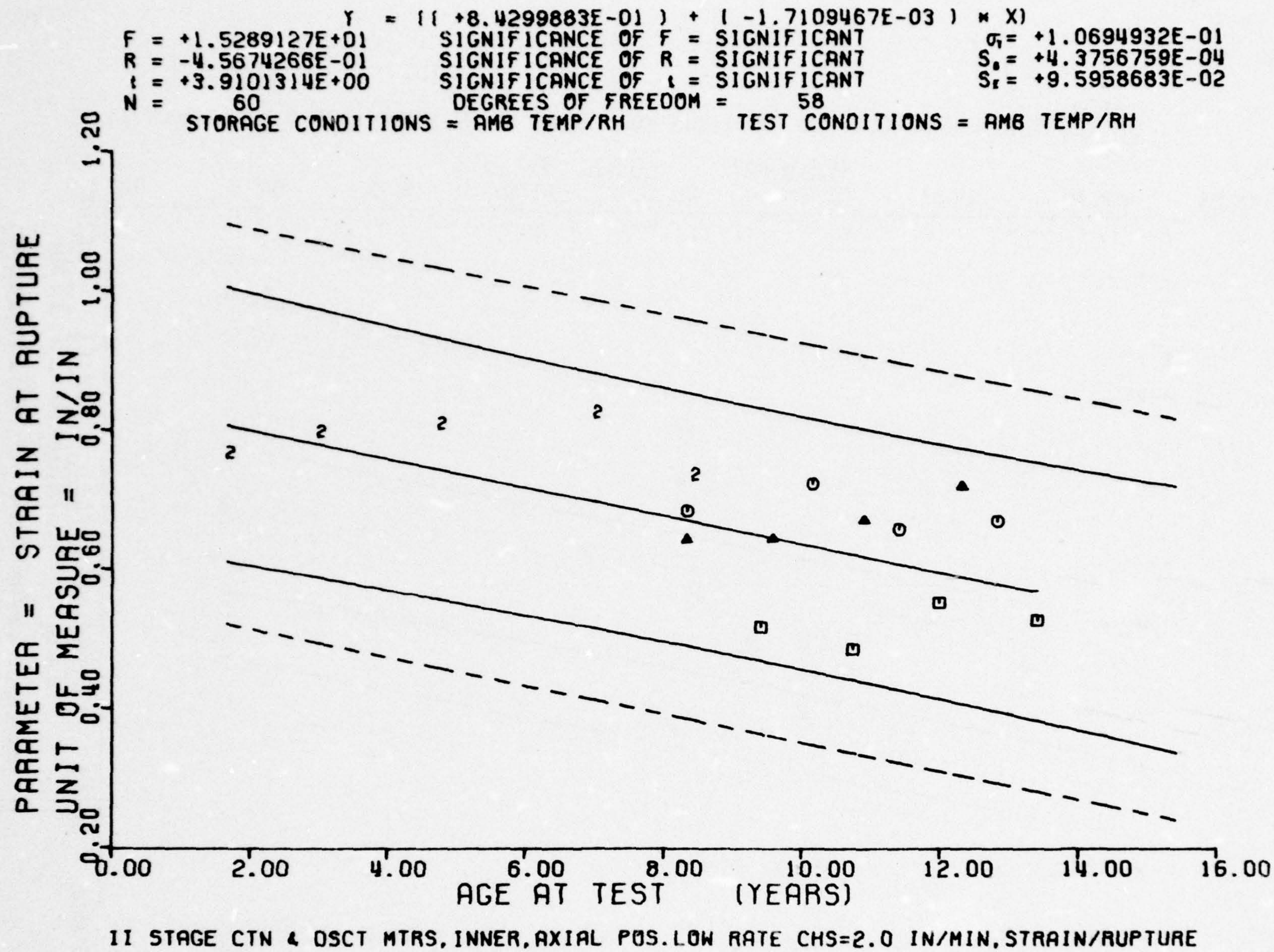

Y = ((+8.4299883E-01) + (-1.7109467E-03) * X)
F = +1.5289127E+01
SIGNIFICANCE OF F = SIGNIFICANT
σ_1 = +1.0694932E-01
R = -4.5674266E-01
SIGNIFICANCE OF R = SIGNIFICANT
S_B = +4.3756759E-04
t = +3.9101314E+00
SIGNIFICANCE OF t = SIGNIFICANT
S_E = +9.5958683E-02
N = 60
DEGREES OF FREEDOM = 58
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.20
0.40
0.60
0.80
1.00
1.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
II STAGE CTN & OSCT MTRS, INNER, AXIAL POS. LOW RATE CHS=2.0 IN/MIN, STRAIN/RUPTURE

Figure 21

Y = ((+1.7340330E+02) + (+5.0741257E+00) * X)

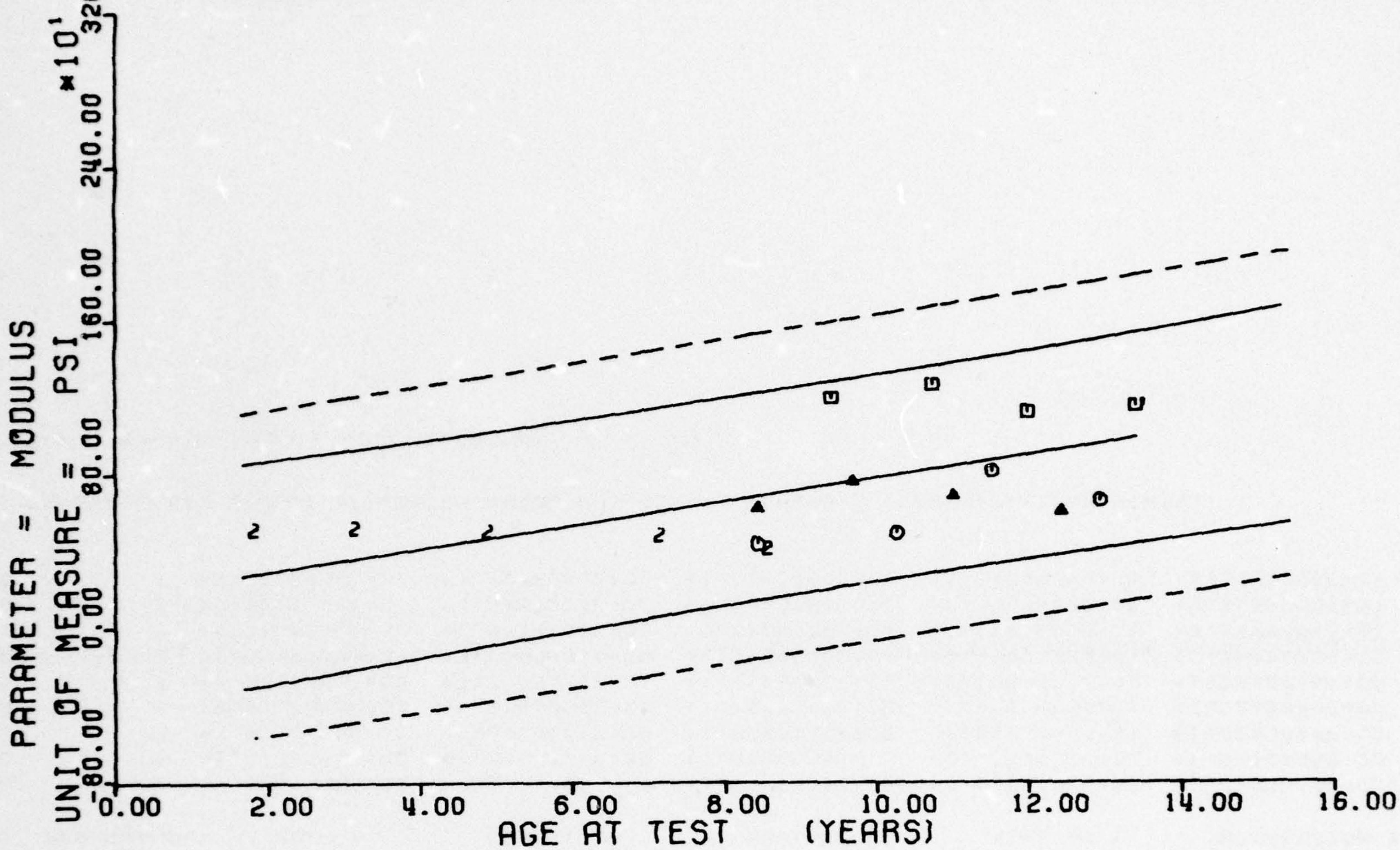
F = +1.5613330E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +3.1456094E+02

R = +4.6054231E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +1.2841431E+00

t = +3.9513707E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +2.8161292E+02

N = 60 DEGREES OF FREEDOM = 58

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE CTN & DSCT MTRS, INNER, AXIAL POS. LOW RATE CHS=2.0 IN/MIN, MODULUS

Figure 22

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
116.0	7	+1.1089993E+02	+8.1731518E+00	+1.1805999E+02	+9.4679992E+01	+1.0736917E+02
122.0	8	+1.0133117E+02	+2.6067477E+00	+1.0520999E+02	+9.7369995E+01	+1.0510545E+02
126.0	2	+1.0618499E+02	+4.8854464E+00	+1.0963999E+02	+1.0272999E+02	+1.0359629E+02
129.0	8	+9.9423645E+01	+6.9566051E+00	+1.0697999E+02	+9.2029998E+01	+1.0246443E+02
130.0	3	+1.1388662E+02	+9.7965671E-01	+1.1476998E+02	+1.1283999E+02	+1.0208714E+02
136.0	3	+9.5599929E+01	+3.1650804E+00	+9.9169998E+01	+9.3149993E+01	+9.9823425E+01
145.0	3	+9.3756591E+01	+2.5700148E+00	+9.6269989E+01	+9.1139999E+01	+9.6427841E+01
155.0	3	+9.3219970E+01	+4.9267017E+00	+9.6449996E+01	+8.7549987E+01	+9.2654968E+01
161.0	3	+9.3129959E+01	+7.7975986E+00	+1.0102999E+02	+8.5439987E+01	+9.0391250E+01

II STAGE CTN & DSCT MTR.OUTER.AXIAL POS.BIAXIAL CHS=0.2 IN/MIN.MAXIMUM STRESS

This sample size summary applies to Figures 23, 24 and 25

Y = ((+1.4526298E+02) + (-3.2981486E-01) * X)

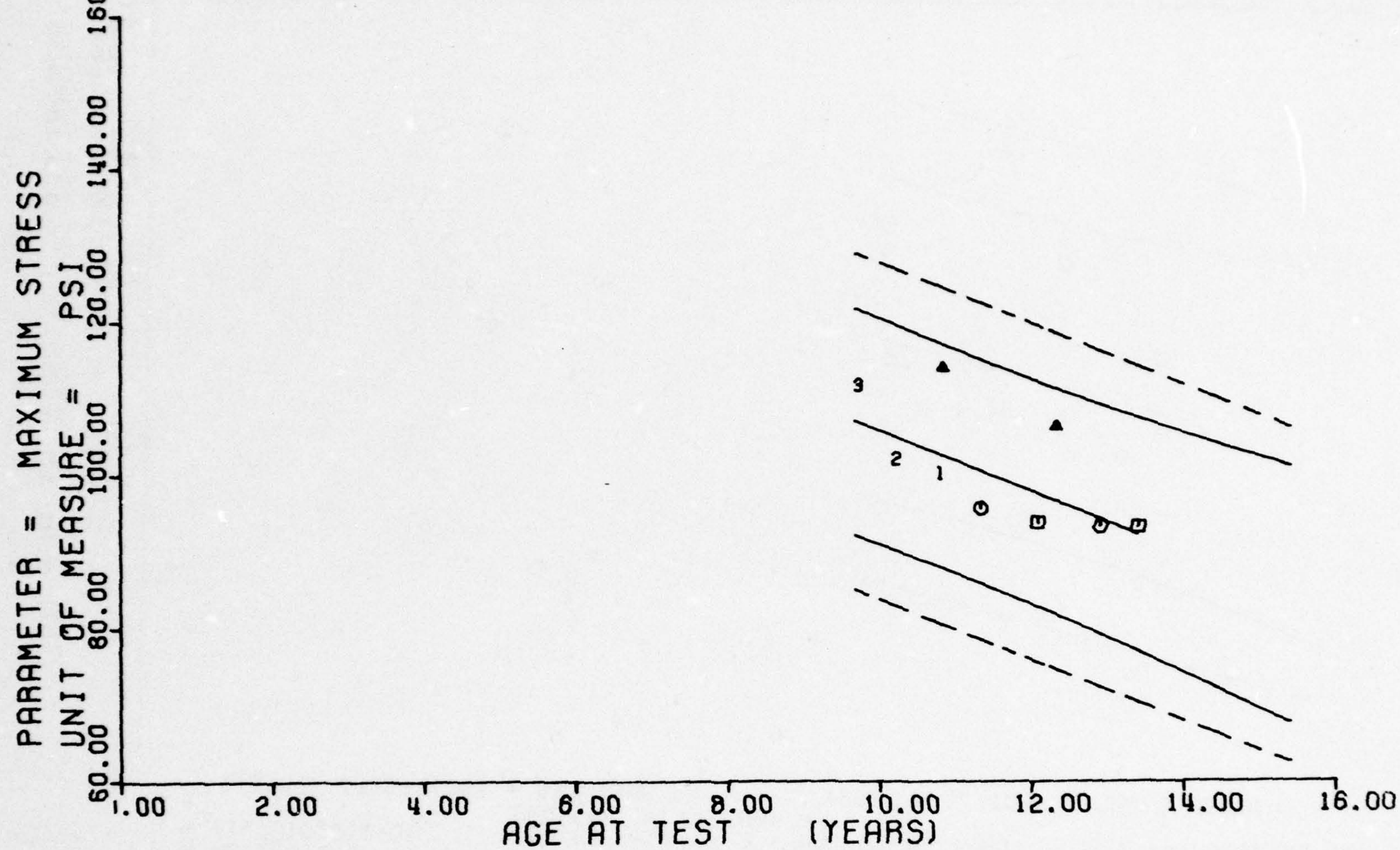
F = +1.6056016E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_T = +8.5833924E+00

R = -5.4500047E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +8.2309758E-02

t = +4.0069959E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +7.2907004E+00

N = 40 DEGREES OF FREEDOM = 38

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE CTN & DSCT MTR, OUTER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN, MAXIMUM STRESS

Figure 23

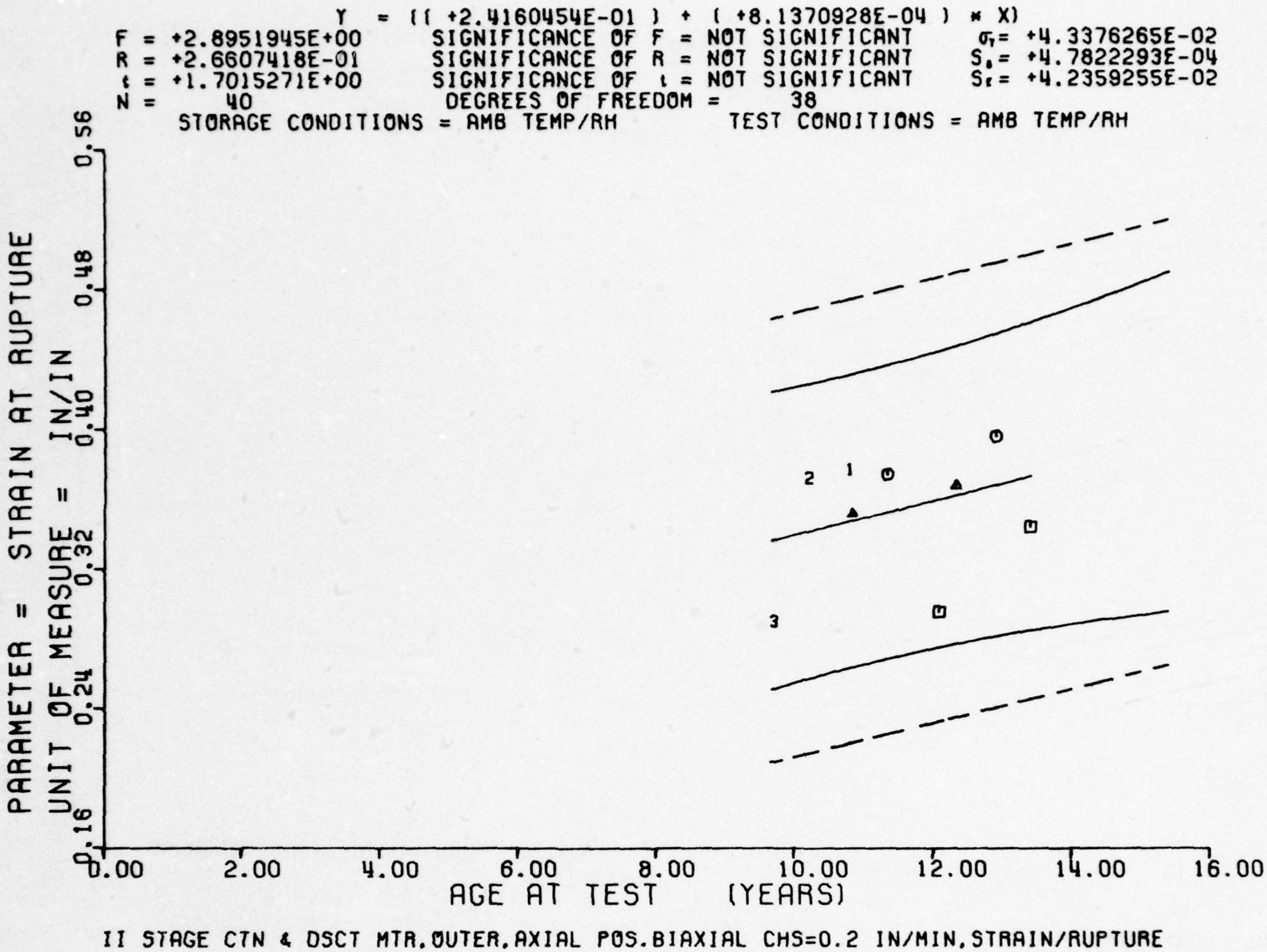

Y = ((+2.4160454E-01) + (+8.1370928E-04) * X)
F = +2.8951945E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σT = +4.3376265E-02
R = +2.6607418E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +4.7822293E-04
t = +1.7015271E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Sr = +4.2359255E-02
N = 40 DEGREES OF FREEDOM = 38
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.16
0.24
0.32
0.40
0.48
0.56
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
1
2
3
II STAGE CTN & DSCT MTR.OUTER.AXIAL POS.BIAXIAL CHS=0.2 IN/MIN.STRAIN/RUPTURE

Figure 24

Y = ((+1.4662969E+03) + (-4.7760769E+00) * X)

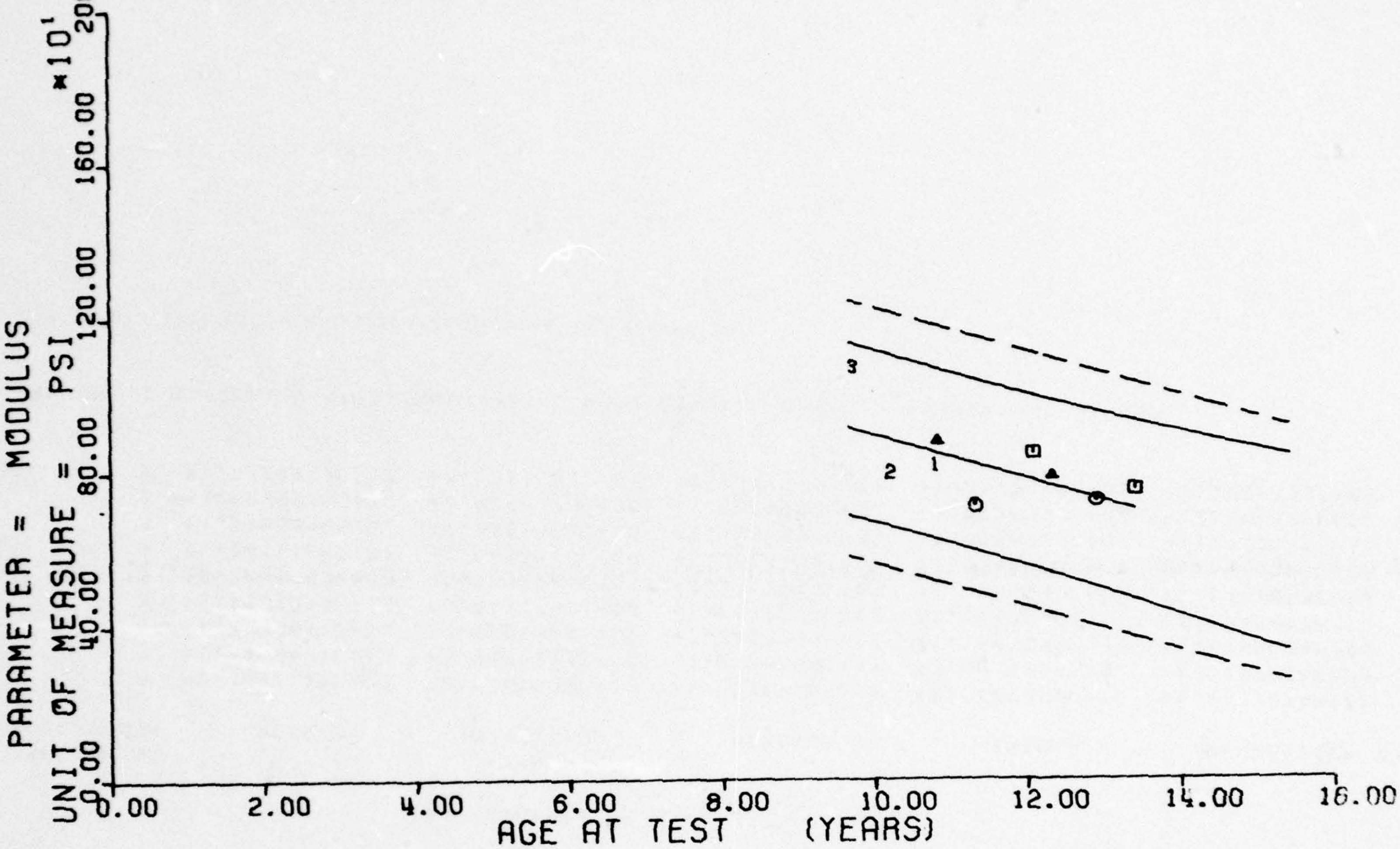
F = +1.4782217E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.2800618E+02

R = -5.2920747E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.2422286E+00

t = +3.8447648E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.1003211E+02

N = 40 DEGREES OF FREEDOM = 38

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE CTN & DSCT MTR,OUTER,AXIAL POS.BIAXIAL CHS=0.2 IN/MIN, MODULUS

Figure 25

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
116.0	8	+1.0881115E+02	+2.0351905E+00	+1.1076998E+02	+1.0468998E+02	+1.1071572E+02
122.0	8	+1.0042492E+02	+4.9396021E+00	+1.0586999E+02	+9.4229995E+01	+1.1153866E+02
129.0	8	+1.2839617E+02	+5.4958664E+00	+1.3267999E+02	+1.1665998E+02	+1.1249874E+02
136.0	3	+1.1561994E+02	+5.4480992E+00	+1.2177999E+02	+1.1143998E+02	+1.1345883E+02
143.0	3	+1.3641992E+02	+6.9537421E-01	+1.3717999E+02	+1.3589999E+02	+1.1441893E+02
145.0	3	+1.0451325E+02	+1.5647966E+00	+1.0629998E+02	+1.0342999E+02	+1.1469323E+02
148.0	3	+1.0155329E+02	+1.2789654E+00	+1.0289999E+02	+1.0035998E+02	+1.1510470E+02
155.0	3	+1.0219326E+02	+1.9096078E+00	+1.0406999E+02	+1.0025999E+02	+1.1606478E+02
161.0	3	+1.2264997E+02	+8.5328667E-01	+1.2347999E+02	+1.2177999E+02	+1.1688772E+02

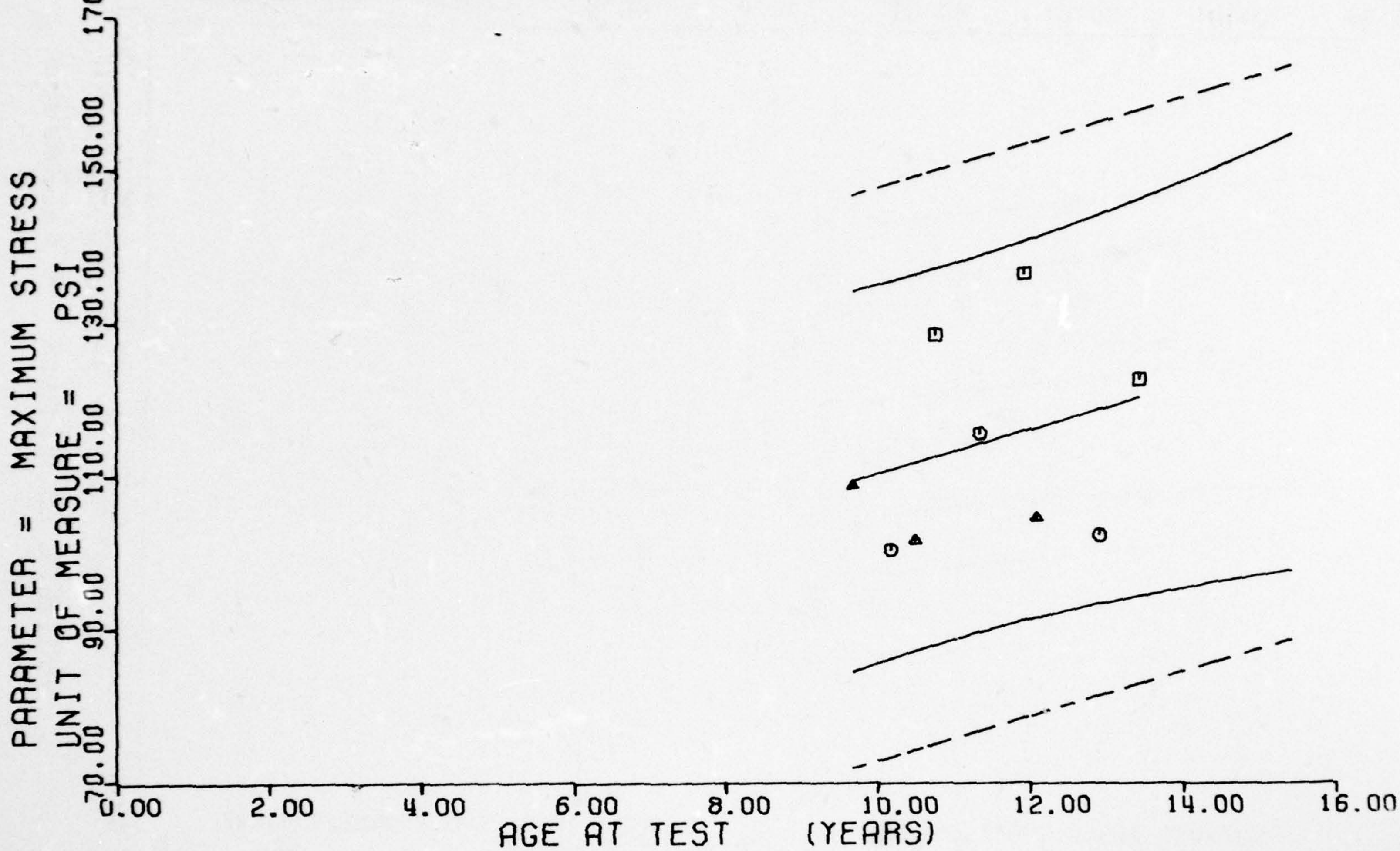
STAGE II DISSECTED MTRS,INNER,AXIAL POS. BIAXIAL CHS=0.2 IN/MIN,MAX STRESS

This sample size summary applies to Figures 26, 27 and 28

$Y = ((+8.1241805E+01) + (+2.4173367E-01) * X)$

F = +3.0245126E+00	SIGNIFICANCE OF F = NOT SIGNIFICANT	σ_T = +1.2778240E+01
R = +2.6513662E-01	SIGNIFICANCE OF R = NOT SIGNIFICANT	S_B = +1.3899828E-01
t = +1.7391126E+00	SIGNIFICANCE OF t = NOT SIGNIFICANT	S_E = +1.2473978E+01
N = 42	DEGREES OF FREEDOM = 40	

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



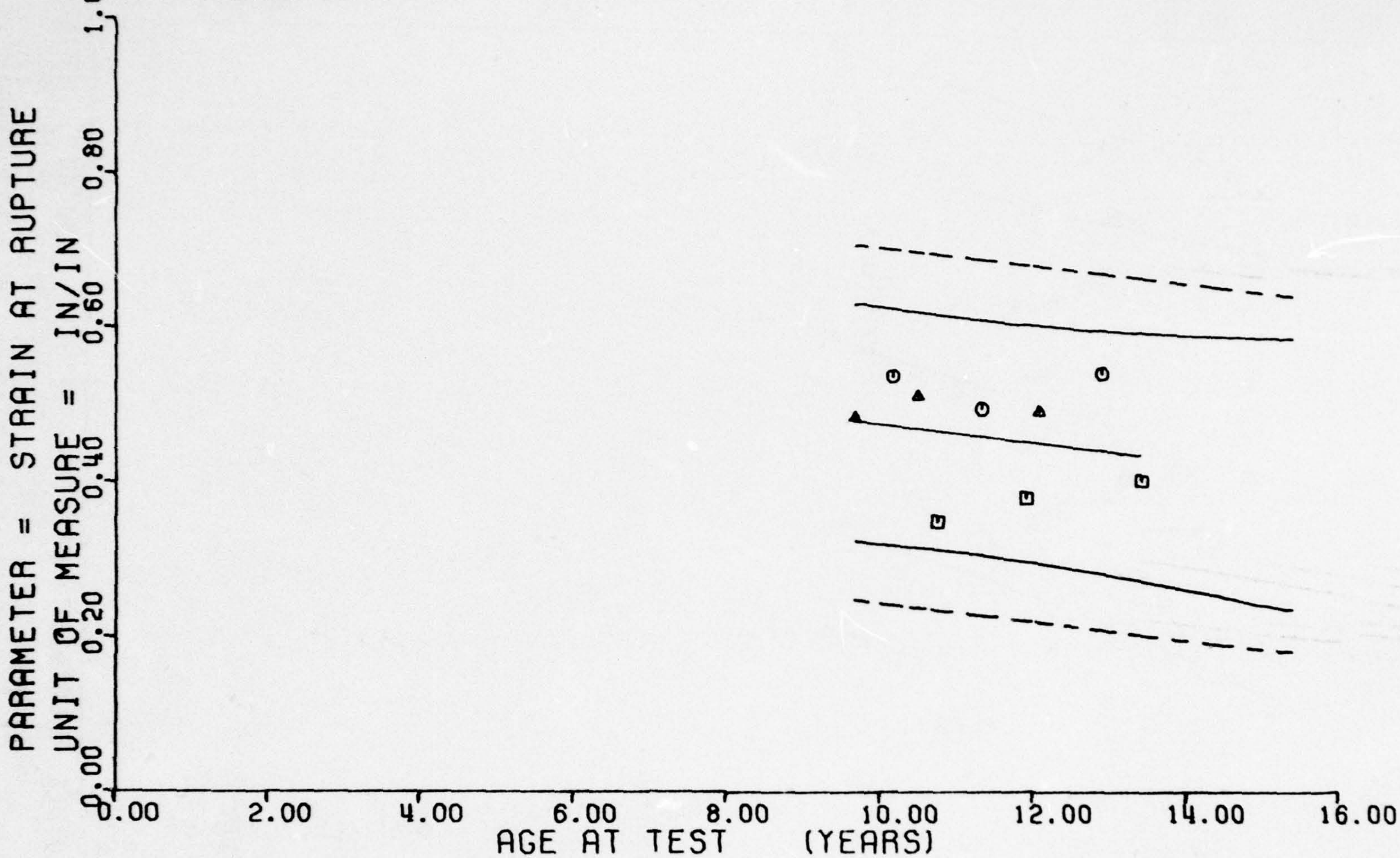
STAGE II DISSECTED MTRS, INNER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN, MAX STRESS

Figure 26

Y = ((+5.9382842E-01) + (-1.0067570E-03) * X)

F = +1.4106617E+00   SIGNIFICANCE OF F = NOT SIGNIFICANT σ_T = +7.6449201E-02
R = -1.8456755E-01   SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +8.4764353E-04
t = +1.1877128E+00   SIGNIFICANCE OF t = NOT SIGNIFICANT S_t = +7.6069190E-02
N = 42   DEGREES OF FREEDOM = 40

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, INNER, AXIAL POS, BIAXIAL CHS=0.2 IN/MIN, STRAIN AT RUPURE

Figure 27

Y = ((+7.6520127E+01) + (+3.9875595E+00) * X)

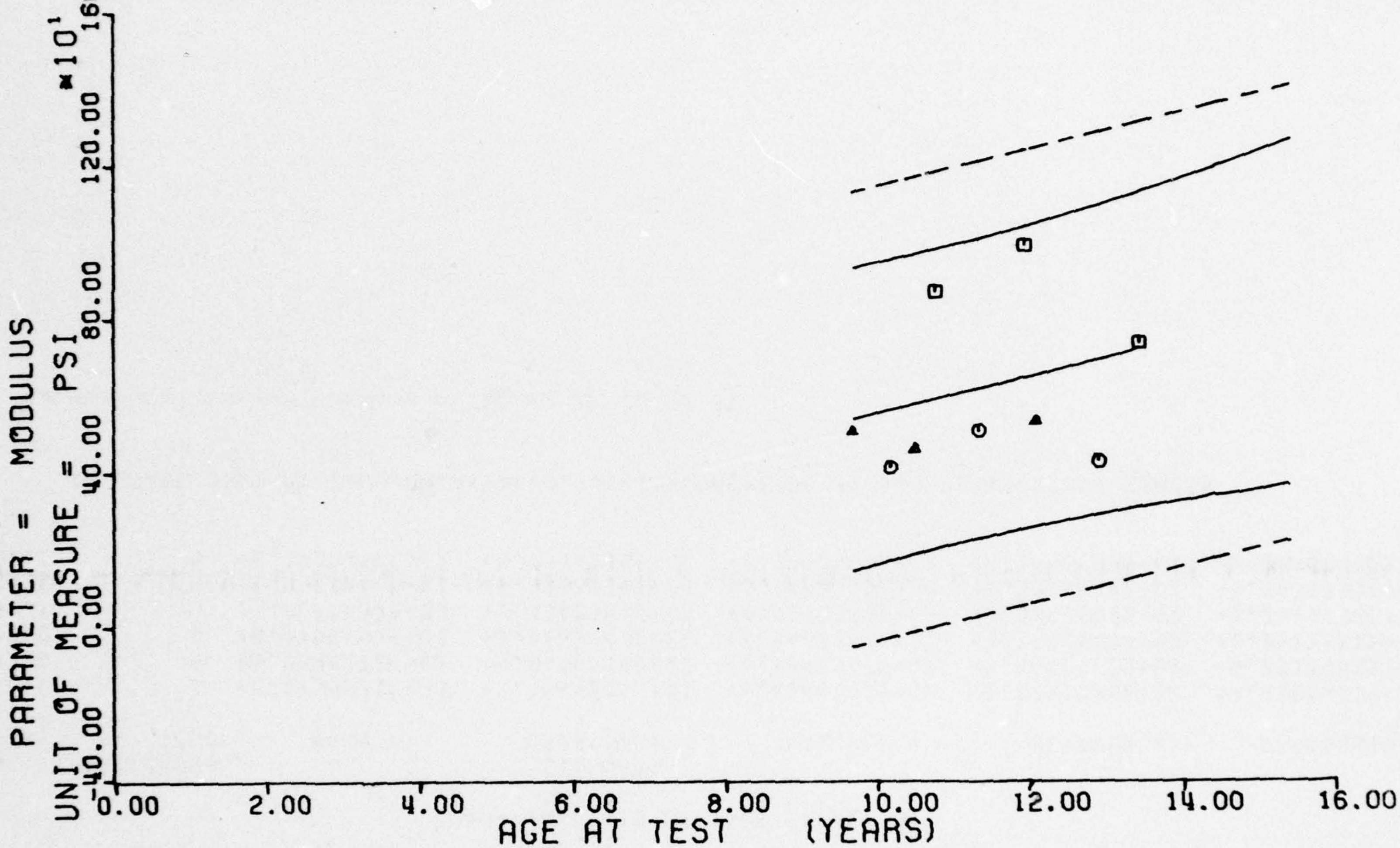
F = +3.2941056E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_1= +2.0260792E+02

R = +2.7583817E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_{β}= +2.1970423E+00

t = +1.8149671E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_{ε}= +1.9716688E+02

N = 42 DEGREES OF FREEDOM = 40

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, INNER, AXIAL POS, BIAXIAL CHS=0.2 IN/MIN, MODULUS

Figure 28

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
116.0	8	+6.2769580E+02	+1.3668804E+01	+6.4366992E+02	+6.0285986E+02	+6.2306811E+02
122.0	8	+6.0893212E+02	+9.2450688E+00	+6.1859985E+02	+5.9466992E+02	+6.2357958E+02
129.0	8	+6.3754589E+02	+1.4666867E+01	+6.5463989E+02	+6.1350000E+02	+6.2417651E+02
148.0	3	+6.0643652E+02	+2.3380559E+00	+6.0872998E+02	+6.0393994E+02	+6.2579638E+02
155.0	3	+6.3951660E+02	+6.4245224E+00	+6.4642993E+02	+6.3372998E+02	+6.2639331E+02
161.0	3	+6.2420654E+02	+8.2544035E+00	+6.3342993E+02	+6.1750000E+02	+6.2690478E+02

II STAGE DSCT MTRS,OUTER,AXIAL,H.R.TRIAX.CHS=1750 AT 500 PSI,MAXIMUM STRESS

This sample size summary applies to Figures 29, 30 and 31

Y = ((+6.1317788E+02) + (+8.5261040E-02) * X)

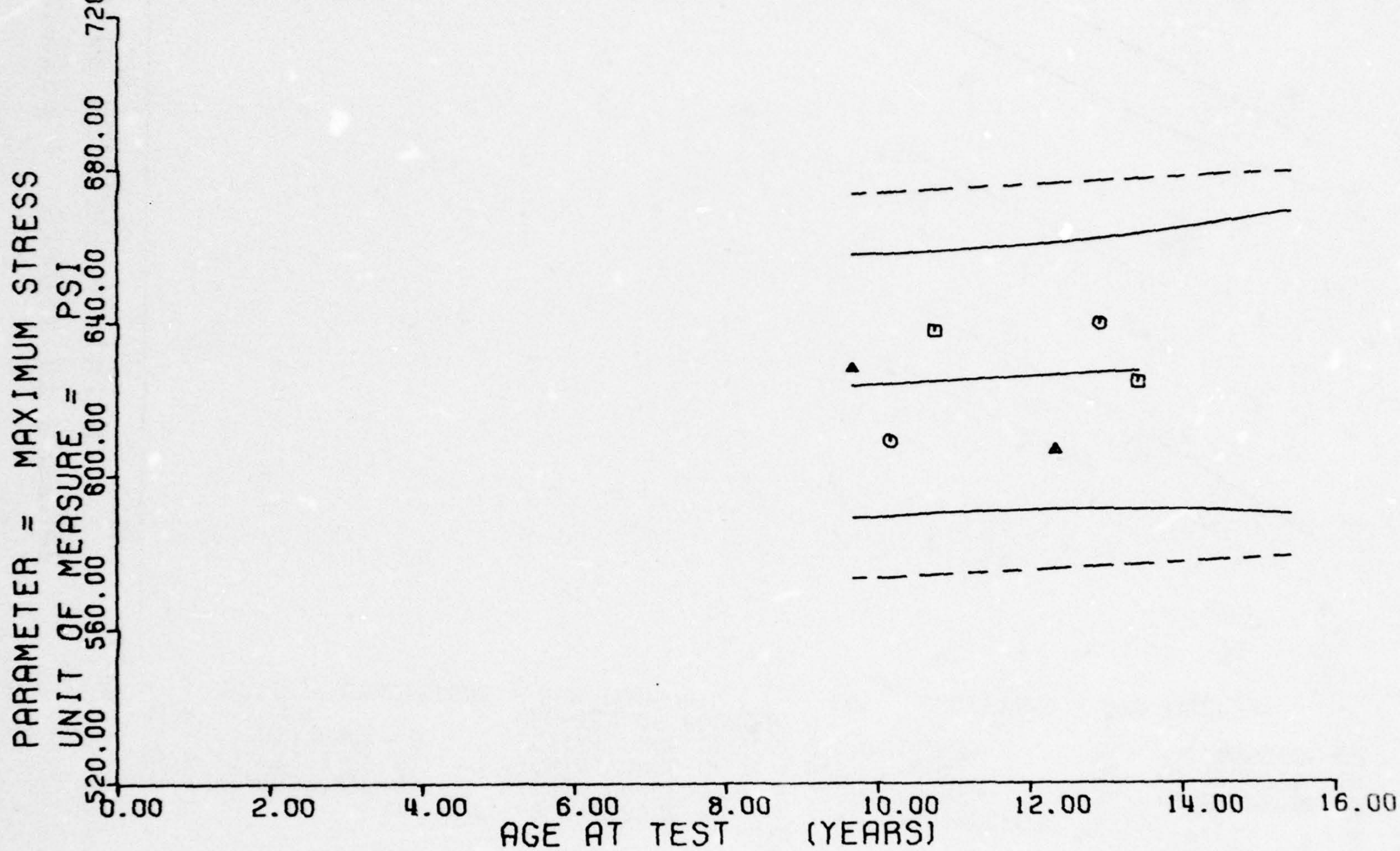
F = +2.0324625E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.6466196E+01

R = +8.0707034E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_b = +1.8912082E-01

t = +4.5082841E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ε = +1.6675097E+01

N = 33 DEGREES OF FREEDOM = 31

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS,OUTER,AXIAL,H.R.TRIAX.CHS=1750 AT 500 PSI,MAXIMUM STRESS

Figure 29

Y = ((+9.0486850E-02) + (+2.0792130E-03) * X)

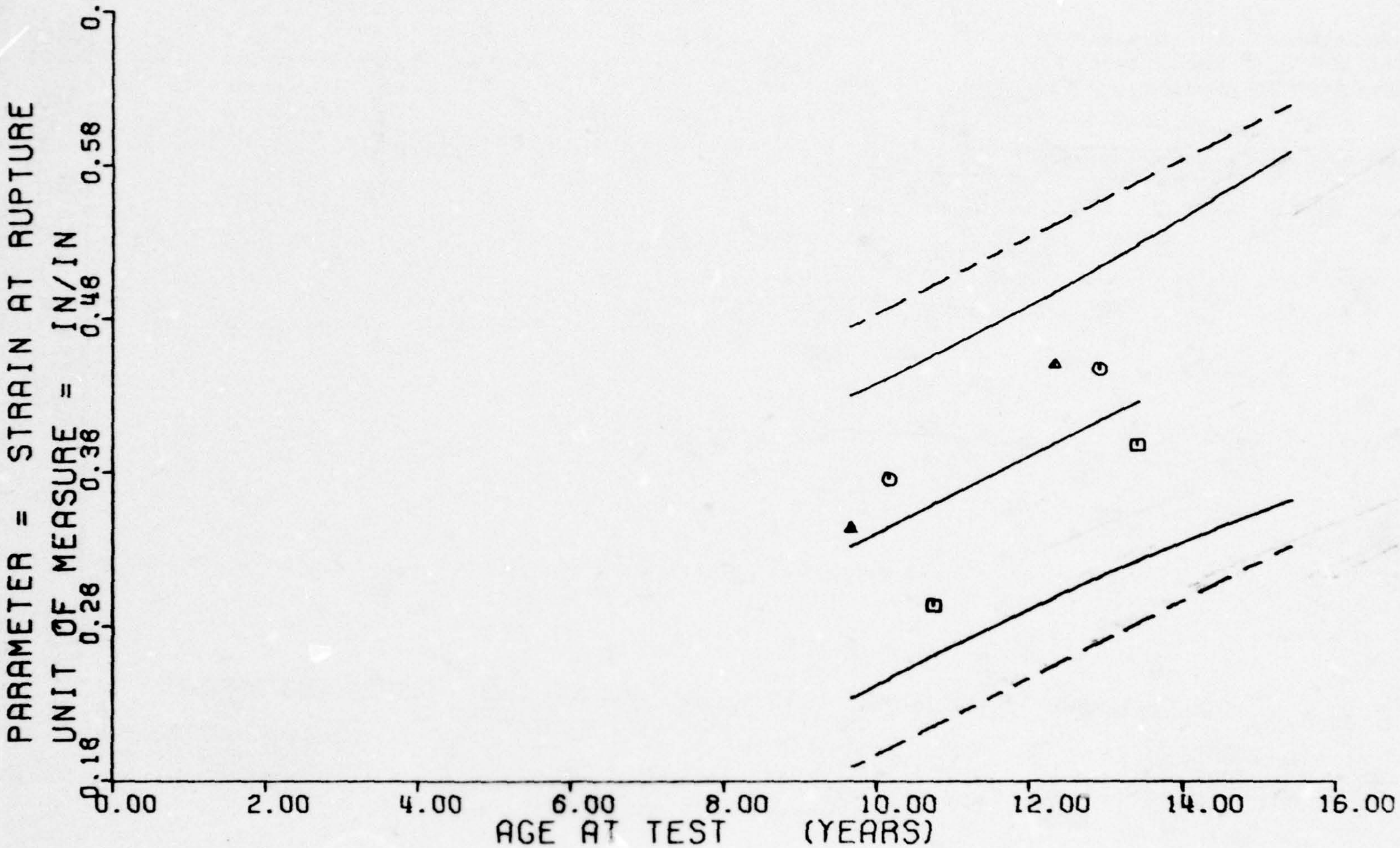
F = +1.4836097E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +5.6963545E-02

R = +5.6892632E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +5.3980778E-04

t = +3.8517655E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +4.7595750E-02

N = 33 DEGREES OF FREEDOM = 31

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



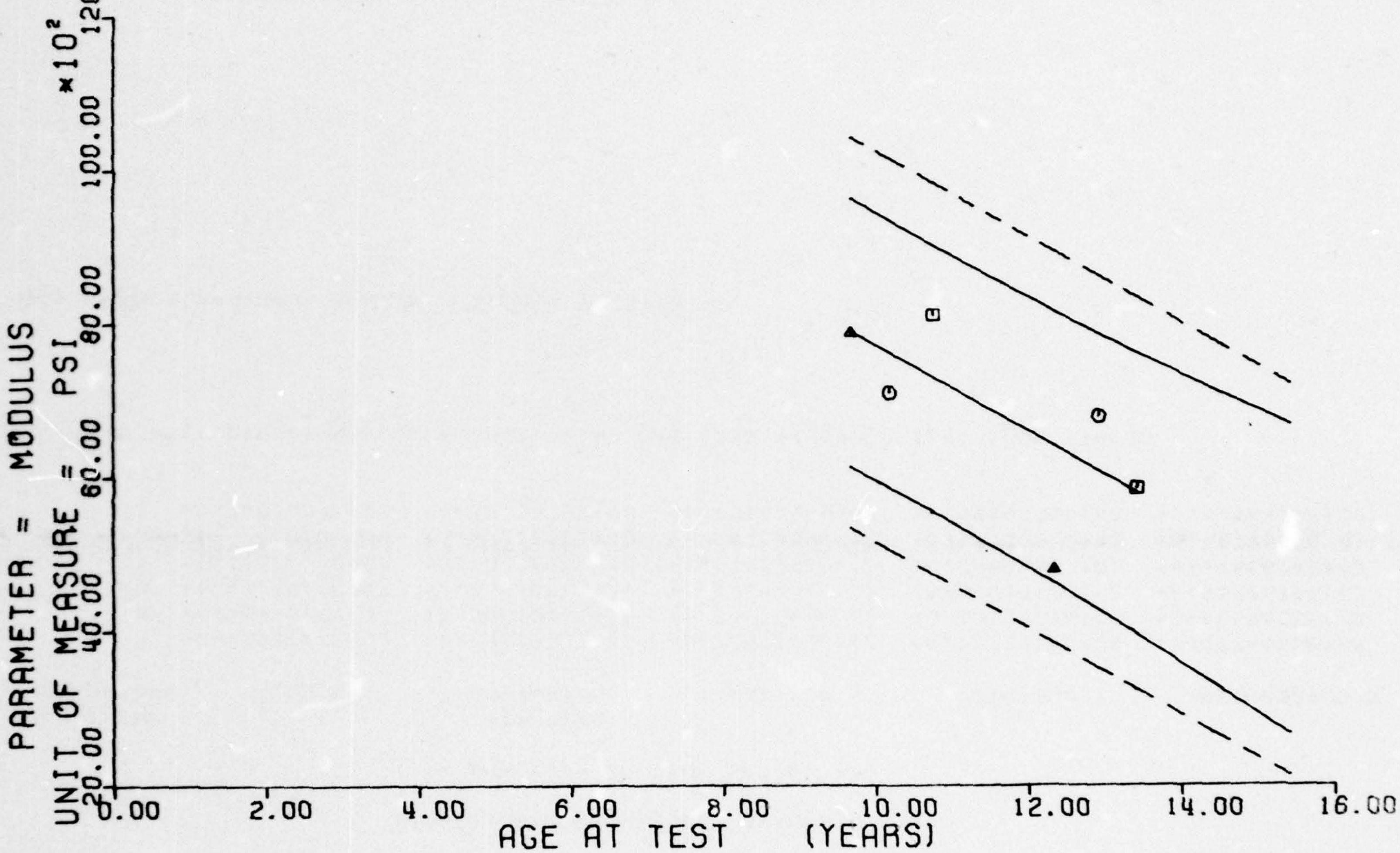
II STAGE DSCT MTRS, OUTER, AXIAL, H.R. TRIAX. CHS=175W AT 500 PSI, STRAIN/RUPTURE

Figure 30

Y = ((+1.3290306E+04) + (-4.6635887E+01) * X)

F = +2.3661432E+01   SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +1.1048270E+03
R = -6.5793048E-01   SIGNIFICANCE OF R = SIGNIFICANT S_B = +9.5873754E+00
t = +4.8643018E+00   SIGNIFICANCE OF t = SIGNIFICANT S_E = +8.4533484E+02
N = 33   DEGREES OF FREEDOM = 31

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS,OUTER,AXIAL,H.R.TRIAX.CHS=1750 AT 500 PSI, MODULUS

Figure 31

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS CF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
116.0	8	+6.5638C85E+02	+2.2788905E+01	+6.7690991E+02	+6.0677978E+02	+6.5774609E+02
122.0	7	+6.5665502E+02	+1.9959315E+01	+6.8095996E+02	+6.3355981E+02	+6.5659692E+02
129.0	8	+6.6325048E+02	+1.2324878E+01	+6.8808984E+02	+6.5091992E+02	+6.5525610E+02
148.0	3	+6.1255322E+02	+6.7323190E+00	+6.1765991E+02	+6.0489990E+02	+6.5161694E+02
155.0	3	+6.4761303E+02	+4.5513768E+00	+6.5038989E+02	+6.4233984E+02	+6.5027636E+02
161.0	3	+6.7303637E+02	+3.3502709E+00	+6.7514990E+02	+6.6919995E+02	+6.4912719E+02

II STAGE DSCT MTRS.INNER.AXIAL.H.R.TRIAX.CHS=1750 AT 500 PSI.MAXIMUM STRESS

This sample size summary applies to Figures 32, 33 and 34

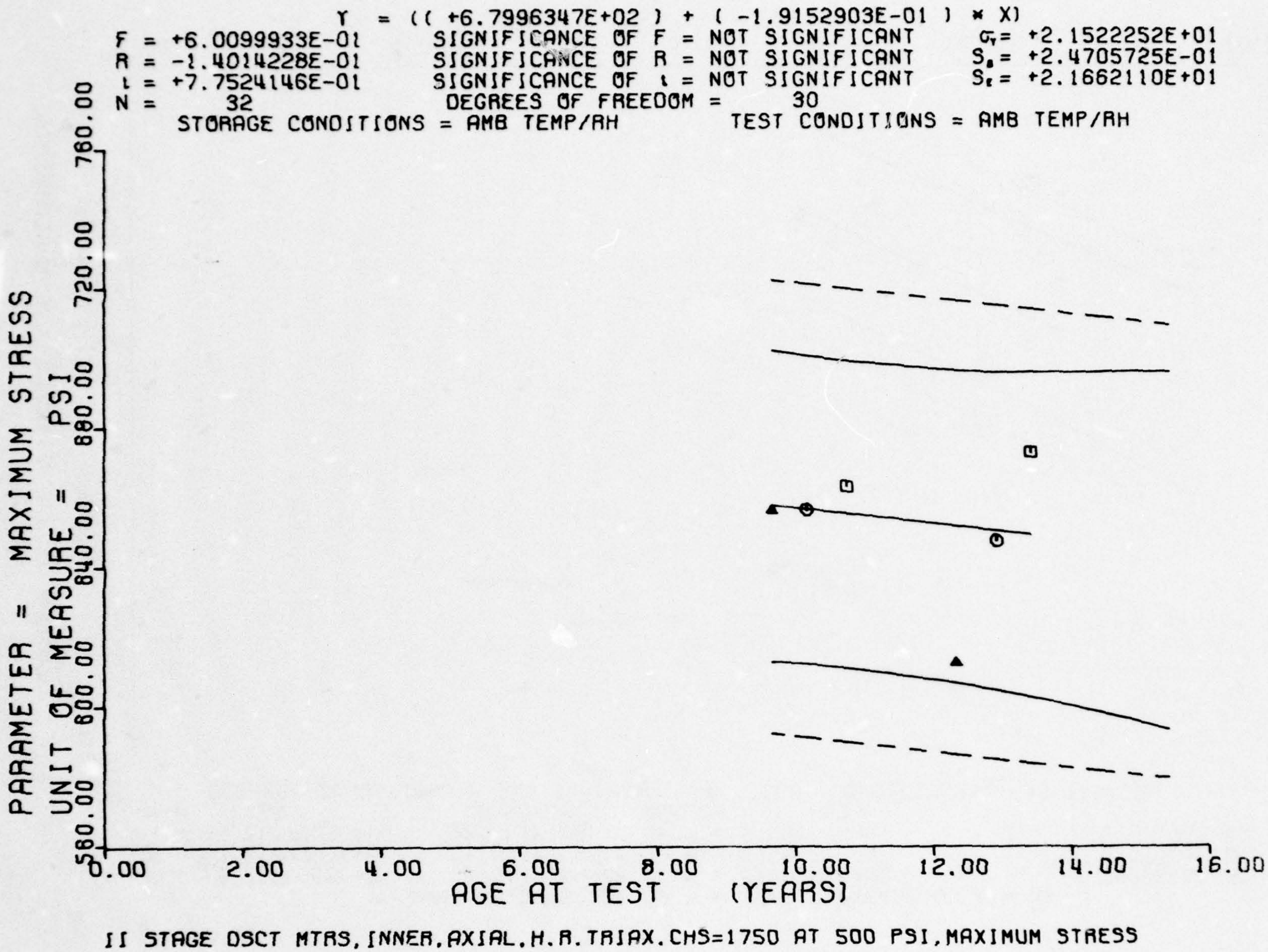
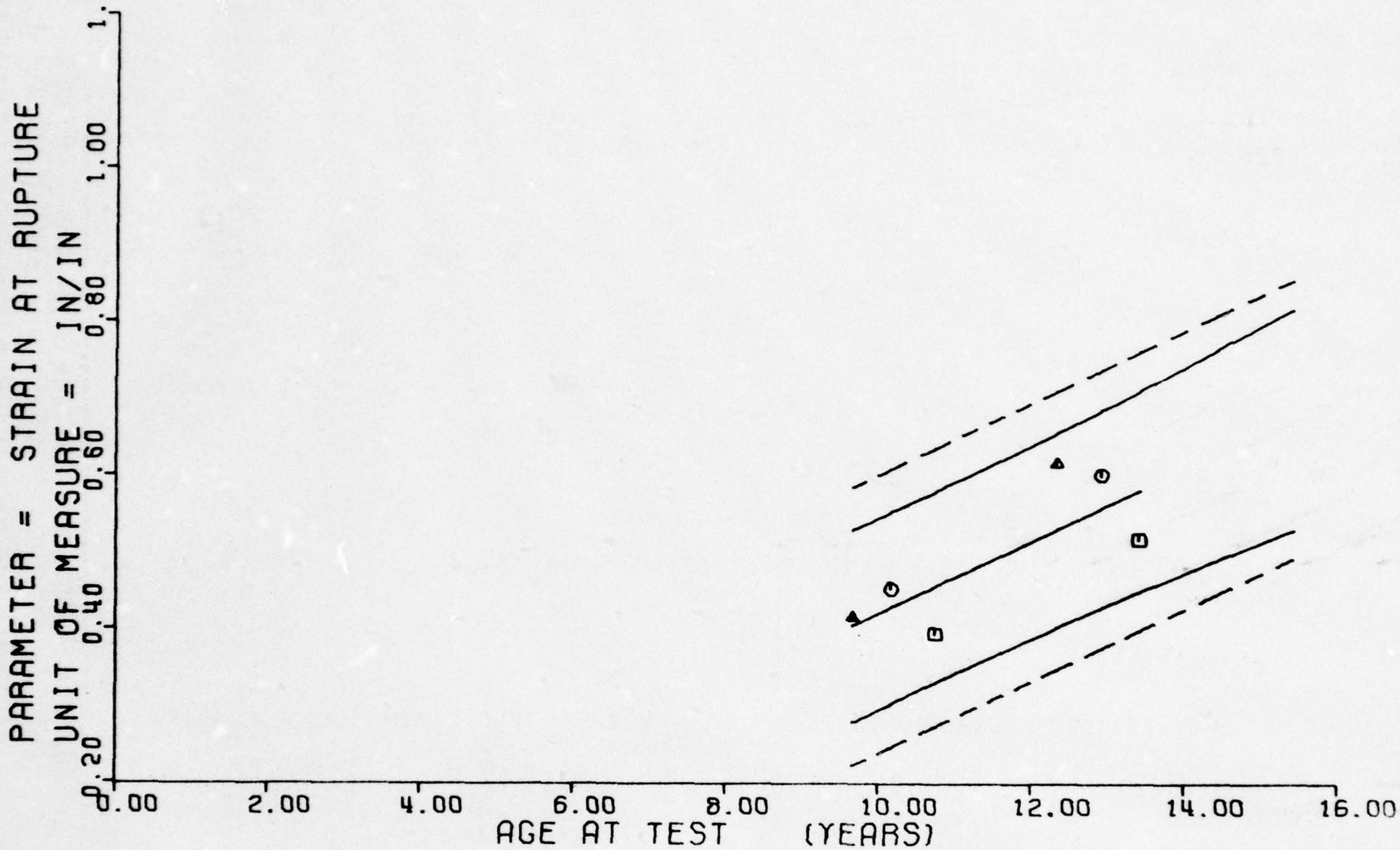

Y = ((+6.7996347E+02) + (-1.9152903E-01) * X)
F = +6.0099933E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +2.1522252E+01
R = -1.4014228E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +2.4705725E-01
t = +7.7524146E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_ϵ = +2.1662110E+01
N = 32 DEGREES OF FREEDOM = 30
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
760.00
720.00
680.00
640.00
600.00
560.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS, INNER, AXIAL, H.R. TRIAX. CHS=1750 AT 500 PSI, MAXIMUM STRESS

Figure 32

Y = ((-5.0575779E-02) + (+3.9194543E-03) * X)

F = +3.2634968E+01	SIGNIFICANCE OF F = SIGNIFICANT	σ_Y = +8.5509575E-02
R = +7.2182707E-01	SIGNIFICANCE OF R = SIGNIFICANT	S_B = +6.8609461E-04
t = +5.7127023E+00	SIGNIFICANCE OF t = SIGNIFICANT	S_E = +6.0157138E-02
N = 32	DEGREES OF FREEDOM = 30	

STORAGE CONDITIONS = AMB TEMP/RH　　TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, INNER, AXIAL, H.R. TRIAX. CHS=1750 AT 500 PSI, STRAIN/RUPTURE

Figure 33

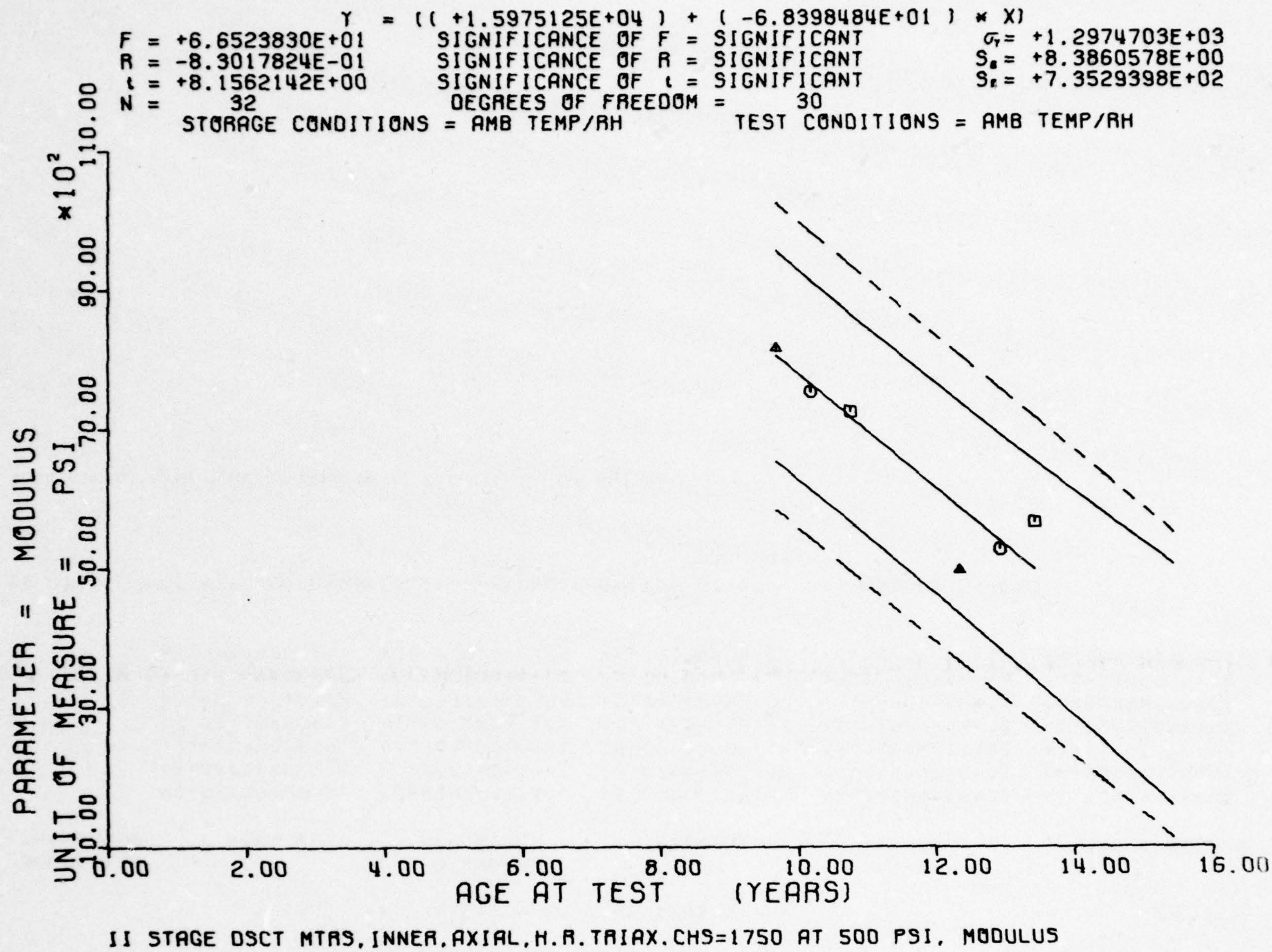

Y = ((+1.5975125E+04) + (-6.8398484E+01) * X)
F = +6.6523830E+01 SIGNIFICANCE OF F = SIGNIFICANT σY = +1.2974703E+03
R = -8.3017824E-01 SIGNIFICANCE OF R = SIGNIFICANT SB = +8.3860578E+00
t = +8.1562142E+00 SIGNIFICANCE OF t = SIGNIFICANT SE = +7.3529398E+02
N = 32 DEGREES OF FREEDOM = 30
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10²
110.00
90.00
70.00
50.00
30.00
10.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS, INNER, AXIAL, H.R. TRIAX. CHS=1750 AT 500 PSI, MODULUS

Figure 34

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
117.0	10	+5.0579980E+02	+1.8140194E+01	+5.3400000E+02	+4.8500000E+02	+4.6058447E+02
124.0	8	+4.7163989E+02	+3.2672605E+01	+5.1744995E+02	+4.2952979E+02	+4.6584741E+02
131.0	11	+4.2857934E+02	+6.9663695E+01	+5.0742993E+02	+3.0756982E+02	+4.7111059E+02
137.0	3	+3.3146972E+02	+1.1748934E+01	+3.4443994E+02	+3.2154980E+02	+4.7562158E+02
148.0	3	+5.4205981E+02	+2.1834794E+00	+5.4407983E+02	+5.3983984E+02	+4.8389208E+02
155.0	3	+5.1894311E+02	+6.1236293E+00	+5.2518994E+02	+5.1295996E+02	+4.8915502E+02
161.0	3	+5.3964306E+02	+2.1730326E+00	+5.4207983E+02	+5.3830981E+02	+4.9366601E+02

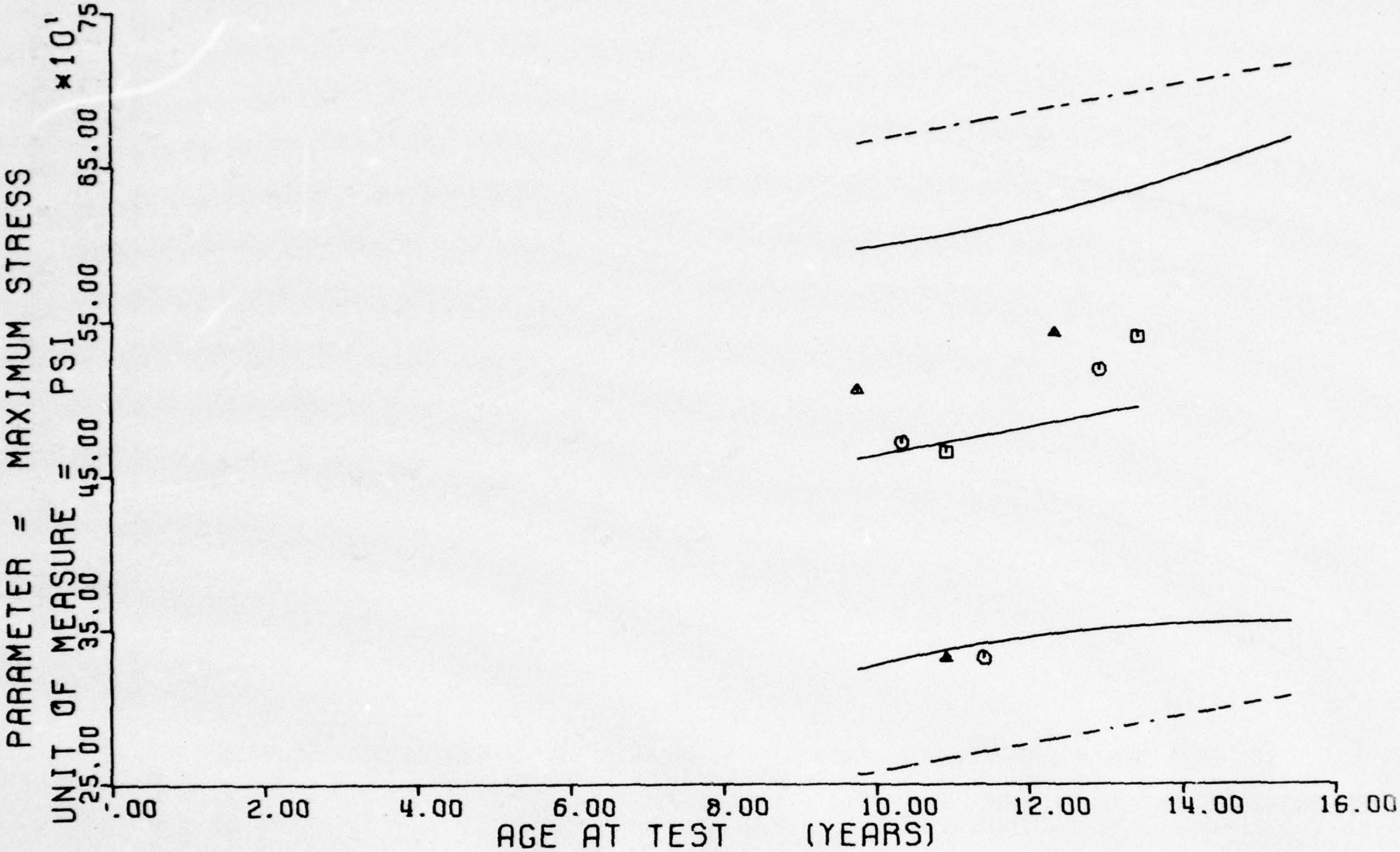
II STAGE DSCT WTRS.OUTER.AXIAL.F.R.HYDRO.CHS=1750 AT 500 PSI.MAXIMUM STRESS

This sample size summary applies to Figures 35, 36 and 37

Y = ((+3.7261772E+02) + (+7.5185410E-01) * X)

F = +9.3866123E-01   SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y= +6.8155131E+01
R = +1.5330548E-01   SIGNIFICANCE OF R = NOT SIGNIFICANT S_b= +7.7603111E-01
t = +9.6884530E-01   SIGNIFICANCE OF t = NOT SIGNIFICANT S_e= +6.8207448E+01
N = 41   DEGREES OF FREEDOM = 39

STORAGE CONDITIONS = AMB TEMP/RH   TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI, MAXIMUM STRESS

Figure 35

Y = ((+2.6595413E-01) + (+1.2685498E-03) * X)

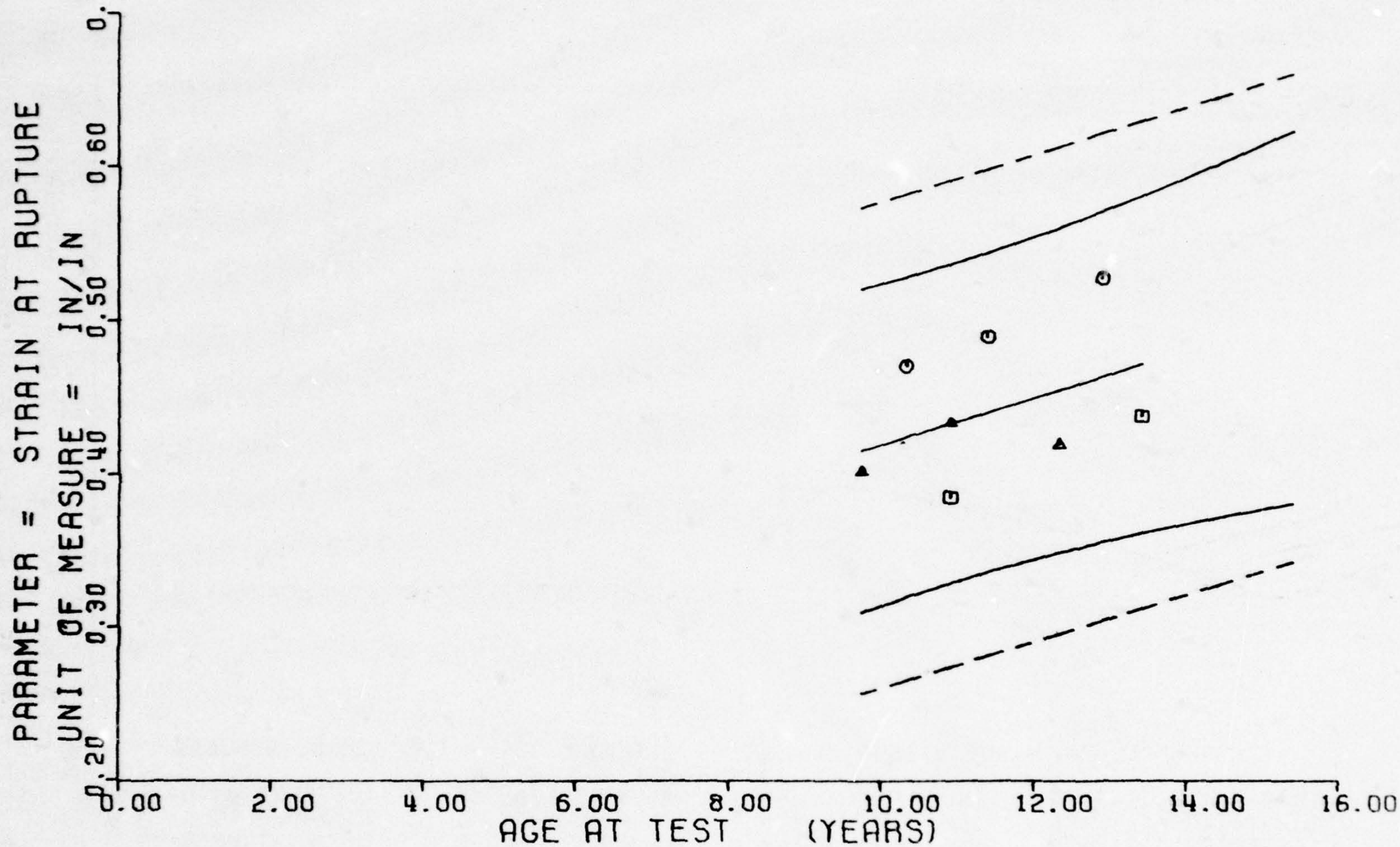
F = +4.4771300E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_Y= +5.4936476E-02

R = +3.2089978E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +5.9952554E-04

t = +2.1159229E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +5.2693902E-02

N = 41 DEGREES OF FREEDOM = 39

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS,OUTER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,STRAIN/RUPTURE

Figure 36

$Y = ((+6.5394061E+02) + (+2.8494901E+01) * X)$

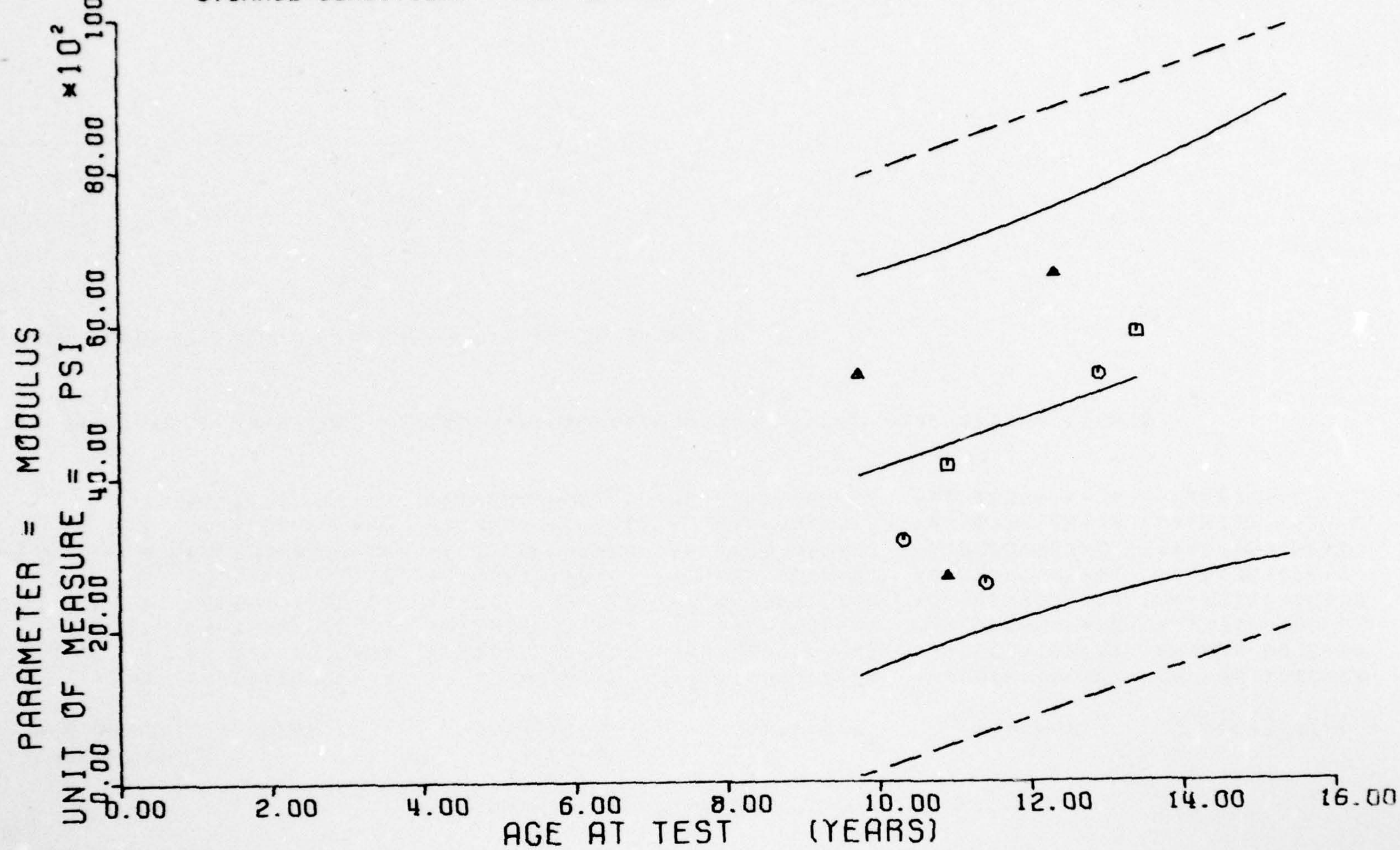
F = +3.6568859E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +1.3524732E+03

R = +2.9279329E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_b = +1.4900863E+01

t = +1.9122986E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +1.3096767E+03

N = 41 DEGREES OF FREEDOM = 39

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI, MODULUS

Figure 37

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

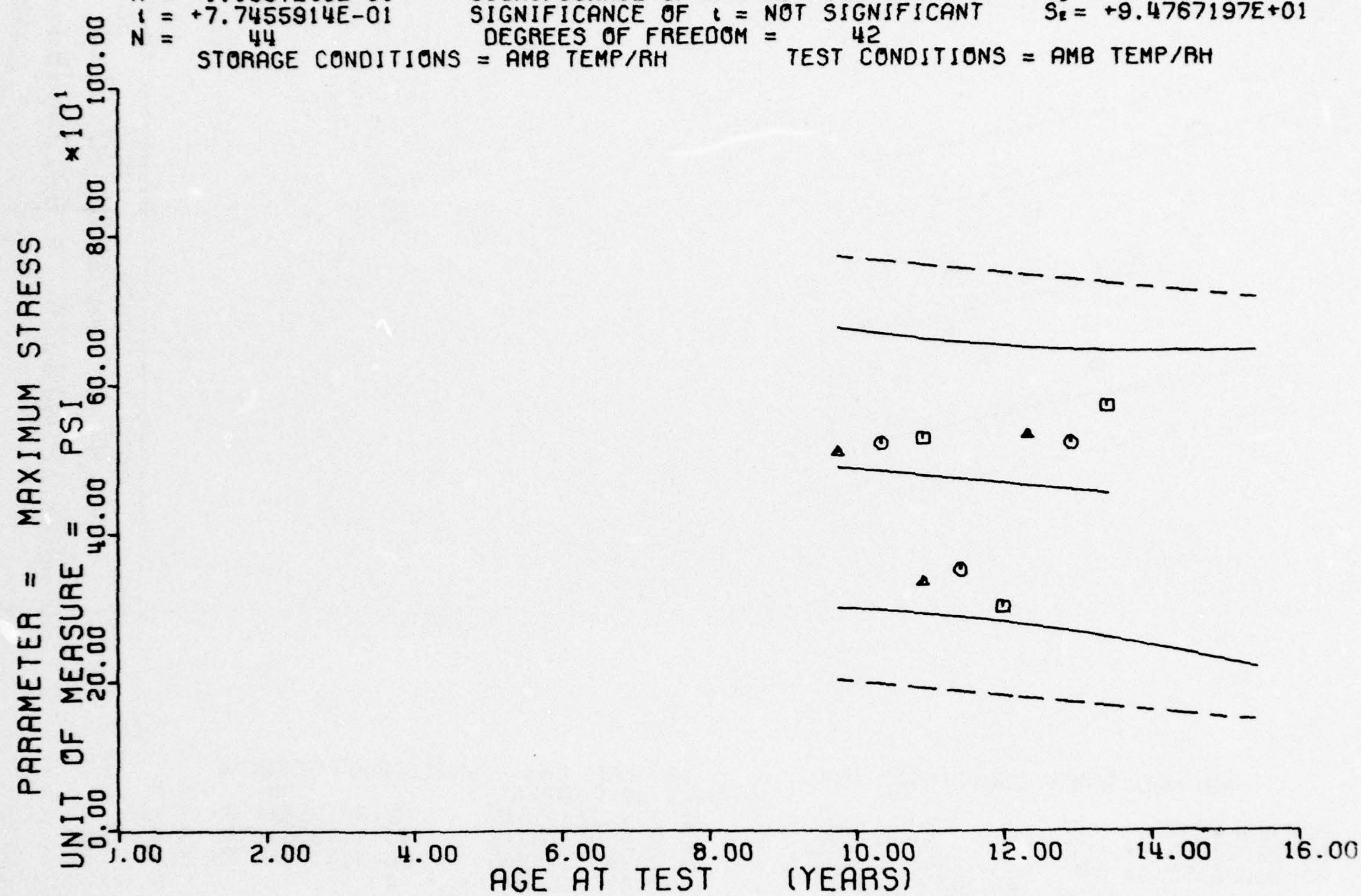
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
117.0	8	+5.1012500E+02	+7.4342354E+00	+5.1900000E+02	+5.0100000E+02	+4.8861132E+02
124.0	8	+5.2212500E+02	+1.0329396E+01	+5.3700000E+02	+5.0800000E+02	+4.8284008E+02
131.0	11	+4.7591796E+02	+3.3815221E+01	+5.5189990E+02	+3.0765991E+02	+4.7706909E+02
137.0	2	+3.5090478E+02	+6.7308742E+00	+3.5565991E+02	+3.4614990E+02	+4.7212231E+02
144.0	6	+3.0096630E+02	+3.7589597E+01	+3.6158984E+02	+2.4850999E+02	+4.6635107E+02
148.0	3	+5.3238647E+02	+4.3107426E+00	+5.3495996E+02	+5.2742993E+02	+4.6305346E+02
155.0	3	+5.2184326E+02	+2.3827694E+01	+5.4444995E+02	+4.9695996E+02	+4.5728223E+02
161.0	3	+5.7210986E+02	+1.1130109E+01	+5.8347998E+02	+5.6123999E+02	+4.5233544E+02

II STAGE DSCT MTRS,INNER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,MAXIMUM STRESS

This sample size summary applies to Figures 38, 39 and 40

Y = ((+5.8507192E+02) + (-8.2444900E-01) * X)

F = +5.9994186E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +9.4325325E+01
R = -1.1867249E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +1.0644106E+00
t = +7.7455914E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +9.4767197E+01
N = 44 DEGREES OF FREEDOM = 42
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

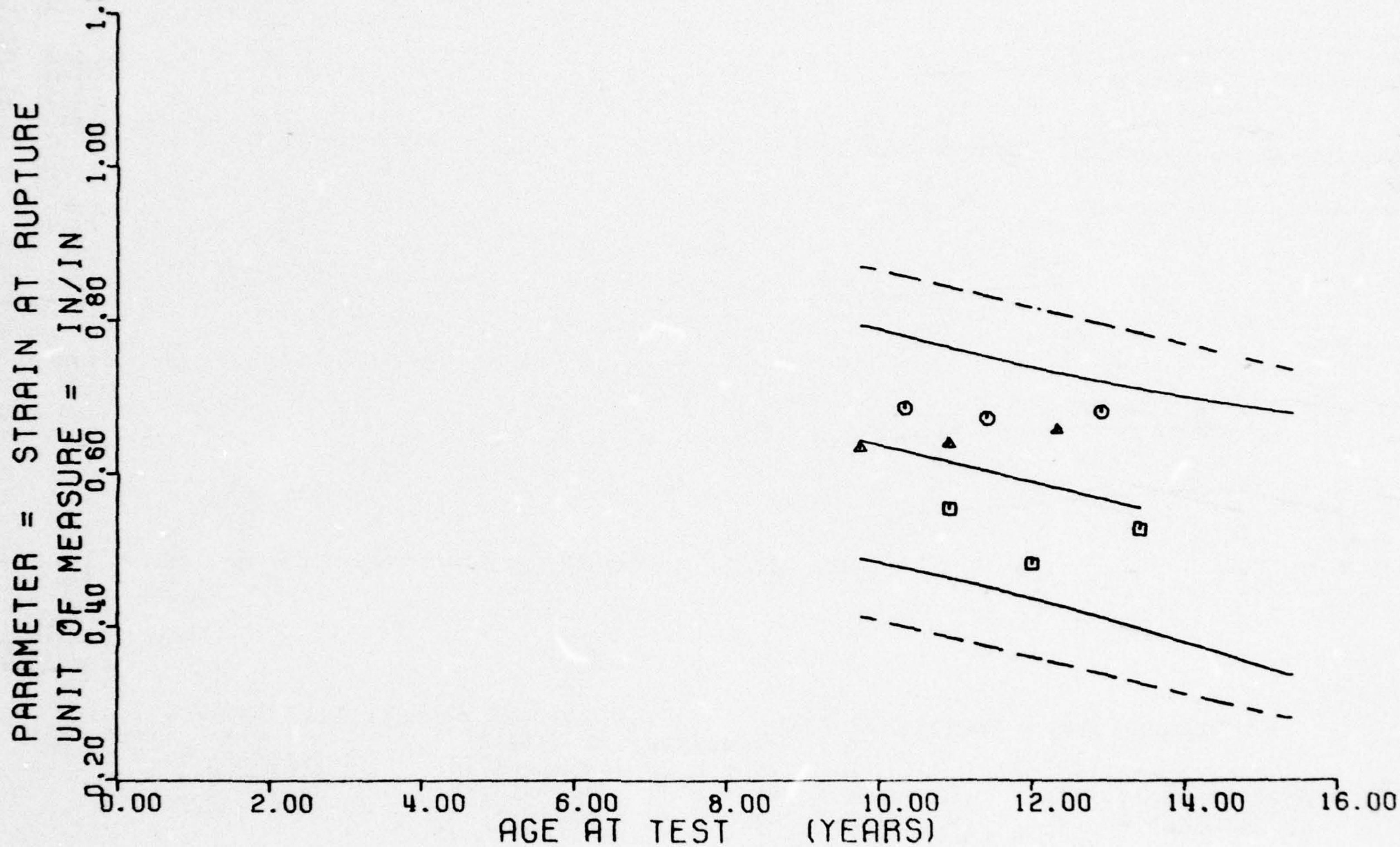


II STAGE DSCT MTRS, INNER, AXIAL, H.R.HYDRO.CHS=1750 AT 500 PSI, MAXIMUM STRESS

Figure 38

Y = ((+8.7539921E-01) + (-1.9995194E-03) * X)

F = +5.5359111E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_T = +7.9553005E-02
R = -3.4125863E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +8.4982808E-04
t = +2.3528517E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +7.5662364E-02
N = 44 DEGREES OF FREEDOM = 42
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS.INNER.AXIAL.H.R.HYDRO.CHS=1750 AT 500 PSI.STRAIN/RUPTURE

Figure 39

Y = ((+9.7635177E+02) + (+2.2619515E+01) * X)

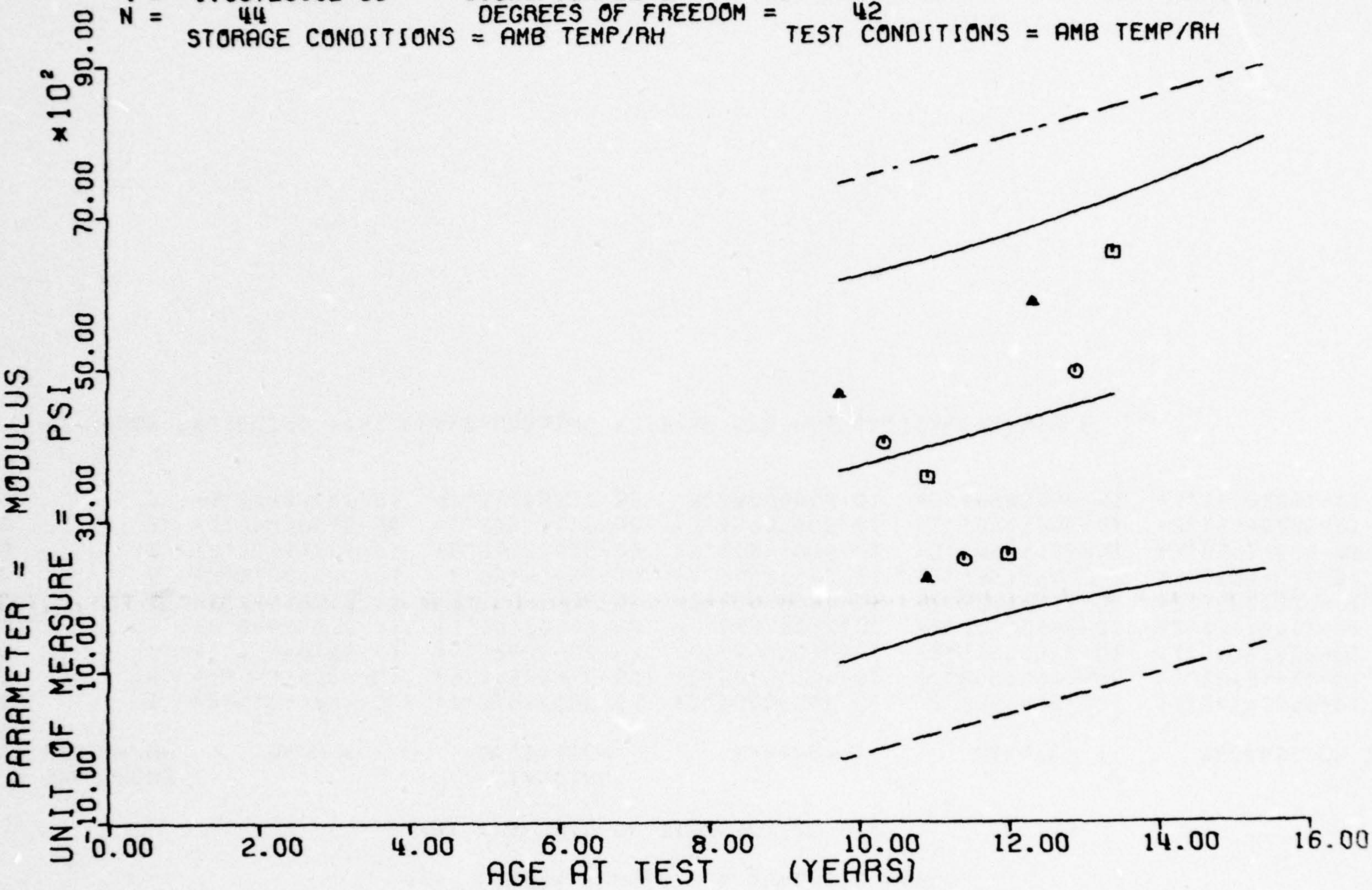
F = +2.5192082E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +1.2910396E+03

R = +2.3788021E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +1.4251194E+01

t = +1.5872013E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_e = +1.2688202E+03

N = 44 DEGREES OF FREEDOM = 42

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE OSCT MTRS, INNER, AXIAL, H.R.HYDRO.CHS=1750 AT 500 PSI, MODULUS

Figure 40

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	8	+2.4124979E-01	+7.3303108E-03	+2.5000000E-01	+2.2599995E-01	+2.3619669E-01
101.0	8	+2.4637472E-01	+5.1938044E-03	+2.5099998E-01	+2.3699998E-01	+2.4053448E-01
112.0	8	+2.5474977E-01	+6.5268895E-03	+2.6599997E-01	+2.4599999E-01	+2.6439255E-01
116.0	6	+2.8466653E-01	+1.2912239E-02	+3.0499994E-01	+2.7099996E-01	+2.7306818E-01
122.0	6	+2.6649963E-01	+2.3808063E-03	+2.6899999E-01	+2.6299995E-01	+2.8608167E-01
129.0	6	+2.8199988E-01	+7.9519349E-03	+2.9699999E-01	+2.7399998E-01	+3.0126404E-01
130.0	3	+3.2133328E-01	+8.3845155E-03	+3.3099997E-01	+3.1599998E-01	+3.0343300E-01
136.0	3	+3.2399994E-01	+1.8357310E-02	+3.4499996E-01	+3.1099998E-01	+3.1644648E-01
143.0	3	+3.5733318E-01	+7.5123672E-03	+3.6499994E-01	+3.4999996E-01	+3.3162885E-01

II STAGE DISSECTED MTRS,OUTER,BURNING RATE AT 500 PSI INITIAL PRESSURE

Y = ((+2.1474290E-02) + (+2.1689132E-03) * X)

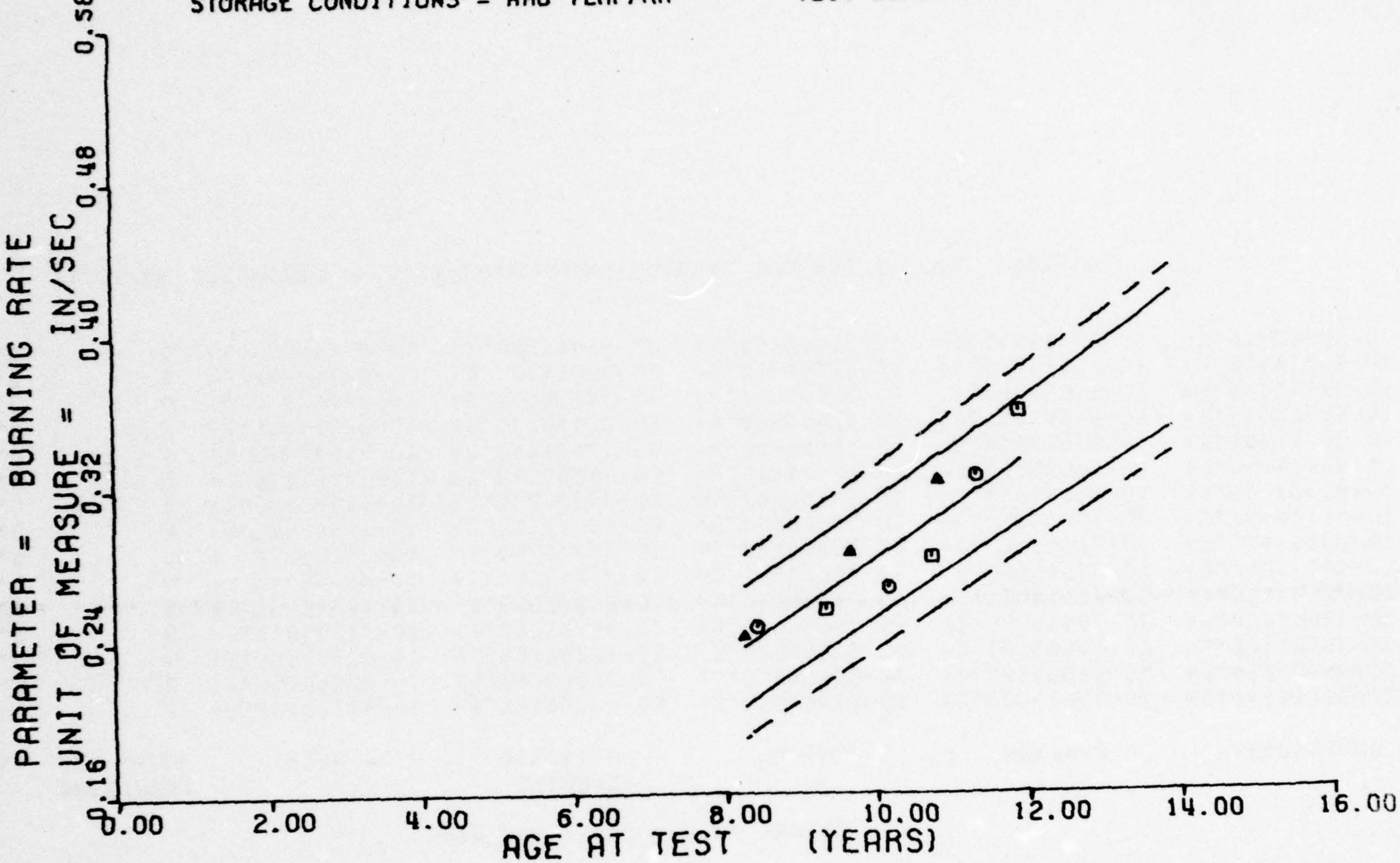
F = +1.7227871E+02 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +3.3781245E-02

R = +8.8236036E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +1.6524425E-04

t = +1.3125498E+01 SIGNIFICANCE OF t = SIGNIFICANT S_E = +1.6057977E-02

N = 51 DEGREES OF FREEDOM = 49

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DISSECTED MTRS, OUTER, BURNING RATE AT 500 PSI INITIAL PRESSURE

Figure 41

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
99.0	8	+3.3949971E-01	+8.7289668E-03	+3.4999996E-01	+3.2299995E-01	+3.4663176E-01
101.0	8	+3.4537458E-01	+7.7998263E-03	+3.5499995E-01	+3.3099997E-01	+3.4824544E-01
112.0	8	+3.3537447E-01	+5.4830428E-03	+3.4299999E-01	+3.2699996E-01	+3.5712063E-01
116.0	6	+3.6566621E-01	+1.1091773E-02	+3.8299995E-01	+3.5299998E-01	+3.6034792E-01
122.0	6	+3.7566626E-01	+2.6392265E-03	+3.7899994E-01	+3.7199997E-01	+3.6518895E-01
129.0	6	+3.5466635E-01	+1.0976121E-02	+3.6899995E-01	+3.3899998E-01	+3.7083679E-01
130.0	3	+4.2899990E-01	+1.0423056E-03	+4.2999994E-01	+4.2799997E-01	+3.7164360E-01
136.0	3	+4.3999987E-01	+8.8926405E-03	+4.4699996E-01	+4.2999994E-01	+3.7648463E-01
143.0	3	+4.0999984E-01	+1.5625256E-02	+4.1999995E-01	+3.9199995E-01	+3.8213247E-01
148.0	3	+3.7133312E-01	+7.5826026E-03	+3.7999999E-01	+3.6599999E-01	+3.8616663E-01
149.0	6	+3.9766645E-01	+8.2492111E-03	+4.0899997E-01	+3.8599997E-01	+3.8697344E-01
154.0	3	+3.7966662E-01	+3.5078943E-03	+3.8299995E-01	+3.7599998E-01	+3.9100766E-01
155.0	6	+4.2283308E-01	+5.1693175E-03	+4.2999994E-01	+4.1399997E-01	+3.9181447E-01
161.0	3	+2.7066659E-01	+1.1371360E-02	+2.7999997E-01	+2.5799995E-01	+3.9665549E-01
162.0	6	+4.0016633E-01	+1.0393267E-02	+4.0899997E-01	+3.8199996E-01	+3.9746230E-01

II STAGE DISSECTED MTRS, INNER, BURNING RATE AT 500 PSI INITIAL PRESSURE

Y = ((+2.6675523E-01) + (+8.0683399E-04) * X)

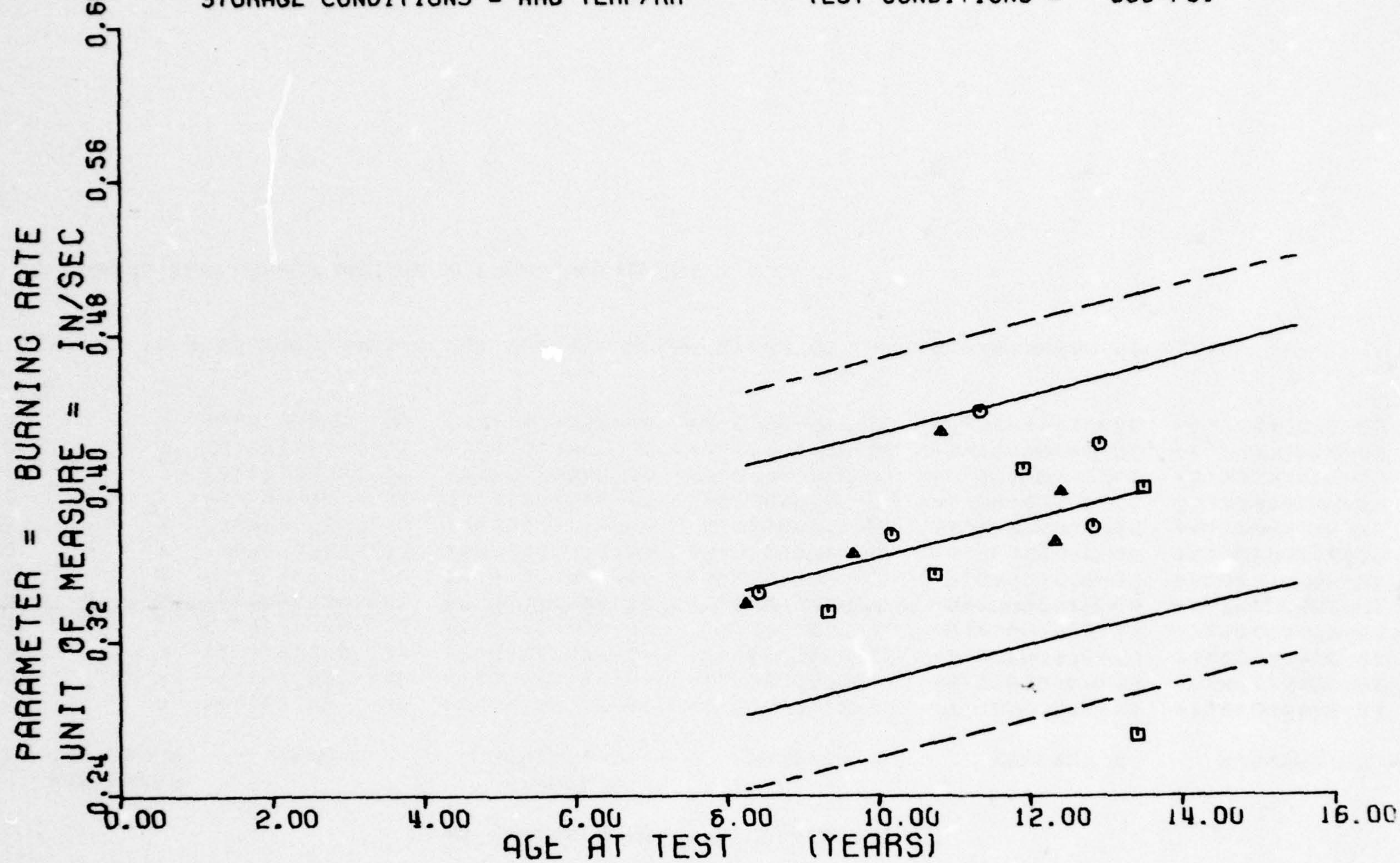
F = +2.0108597E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +3.8572134E-02

R = +4.5741433E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +1.7992573E-04

t = +4.4842610E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +3.4525335E-02

N = 78 DEGREES OF FREEDOM = 76

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI



STAGE II DISSECTED MTRS, INNER, BURNING RATE AT 500 PSI

Figure 42

**** LINEAR REGRESSION ANALYSIS ****

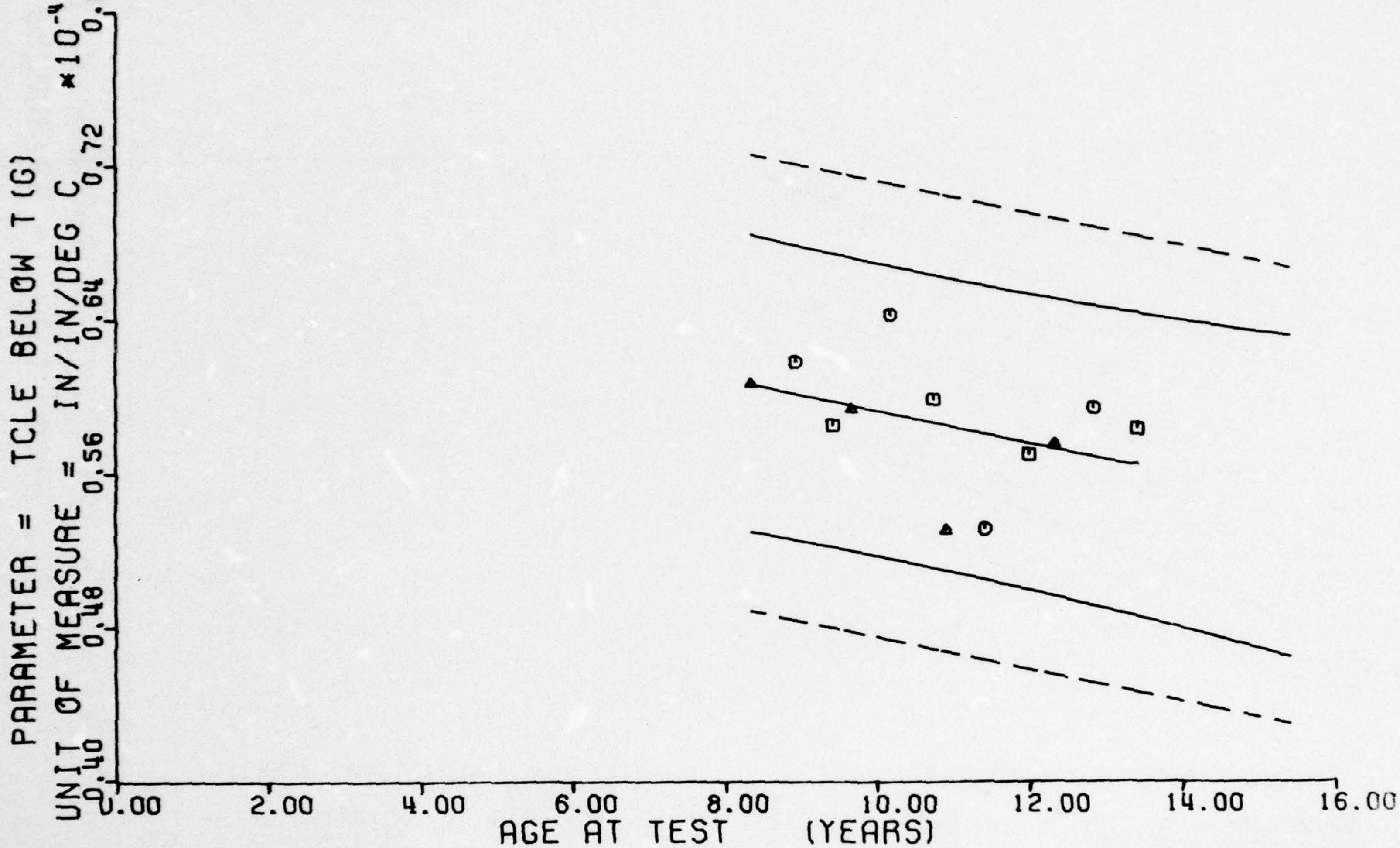
*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
100.0	8	+8.3687424E-05	+5.0910618E-06	+9.0799992E-05	+7.8899989E-05	+7.9120494E-05
107.0	8	+7.6874915E-05	+1.5168314E-05	+1.0239999E-04	+5.5599986E-05	+7.5727642E-05
113.0	8	+7.6187396E-05	+2.2026587E-06	+7.9699995E-05	+7.2299997E-05	+7.2819486E-05
116.0	3	+5.9333324E-05	+1.8579846E-06	+6.0599995E-05	+5.7199998E-05	+7.1365415E-05
122.0	3	+6.4299980E-05	+2.3514228E-06	+6.6999986E-05	+6.2699997E-05	+6.8457258E-05
129.0	3	+5.9899990E-05	+4.8508042E-06	+6.5499989E-05	+5.6999997E-05	+6.5064406E-05
131.0	3	+5.3033320E-05	+5.9910167E-06	+5.9699988E-05	+4.8099987E-05	+6.4095016E-05
137.0	3	+5.3166659E-05	+3.5014814E-06	+5.6599994E-05	+4.9599999E-05	+6.1186859E-05
144.0	3	+5.6999982E-05	+5.3328859E-06	+6.1199985E-05	+5.0999995E-05	+5.7794008E-05
148.0	3	+5.7533325E-05	+4.7088606E-06	+6.2399994E-05	+5.2999996E-05	+5.5855241E-05
154.0	3	+5.9466648E-05	+1.8230929E-06	+6.1099999E-05	+5.7499986E-05	+5.2947085E-05
161.0	3	+5.8366655E-05	+2.3113455E-06	+6.0799997E-05	+5.6199991E-05	+4.9554233E-05

STAGE II DISSECTED MTRS.OUTER.THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

This sample size summary applies to Figures 43 thru 46

```
                 Y   =  (( +6.7782021E-05 )  +  ( -7.0296387E-08 )  * X)
F = +5.8225301E+00     SIGNIFICANCE OF F = SIGNIFICANT          σ = +4.1522382E-06
R = -3.2589397E-01     SIGNIFICANCE OF R = SIGNIFICANT          S = +2.9132458E-08
t = +2.4129919E+00     SIGNIFICANCE OF t = SIGNIFICANT          S = +3.9654066E-06
N =      51              DEGREES OF FREEDOM =      49
     STORAGE CONDITIONS = AMB TEMP/RH           TEST CONDITIONS = 5 DEGREES C/MIN
```



STAGE II DISSECTED MTRS, OUTER, THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

Figure 43

Y = ((+5.1422161E-05) + (+3.0464043E-07) * X)

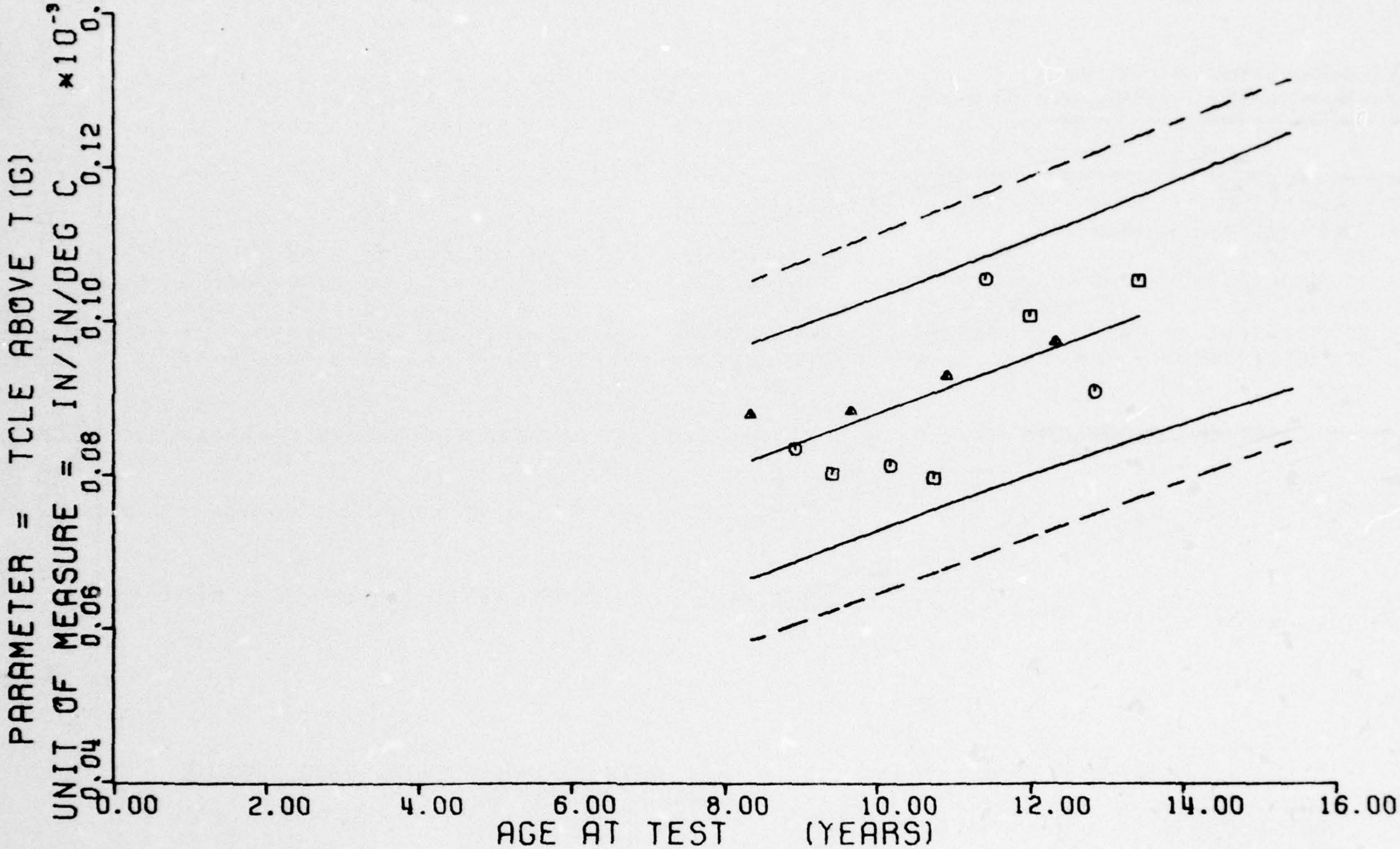
F = +2.8423313E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +9.6785803E-06

R = +6.0590072E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +5.7141309E-08

t = +5.3313519E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +7.7778718E-06

N = 51 DEGREES OF FREEDOM = 49

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSECTED MTRS, OUTER, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 44

Y = ((+6.6772998E-05) + (-6.2858057E-08) * X)

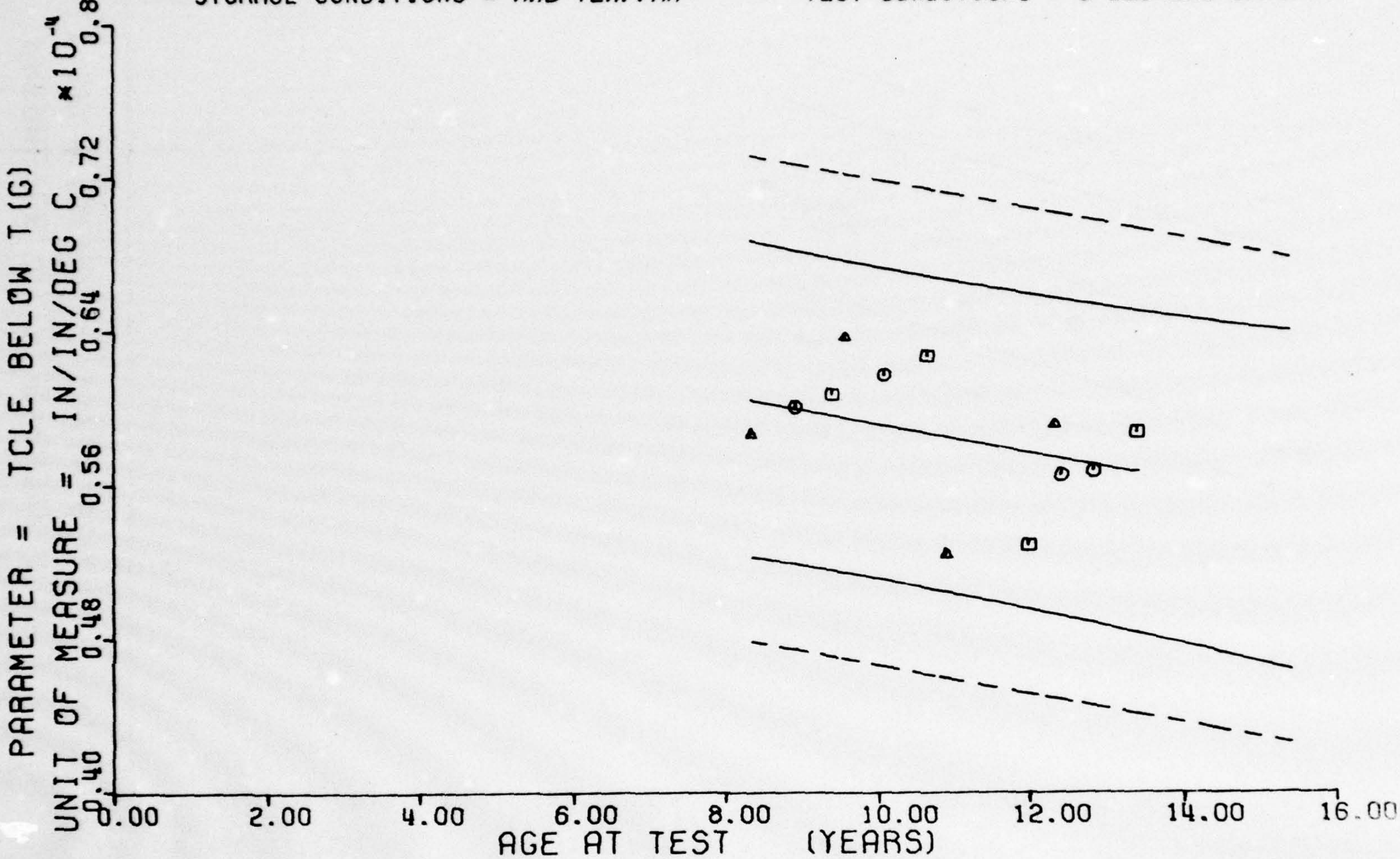
F = +4.4257162E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_1= +4.3636151E-06

R = -2.8781711E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b= +2.9879214E-08

t = +2.1037386E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t= +4.2213976E-06

N = 51 DEGREES OF FREEDOM = 49

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSECTED MTRS, INNER, THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

Figure 45

Y = ((+5.8506018E-05) + (+2.5886156E-07) * X)

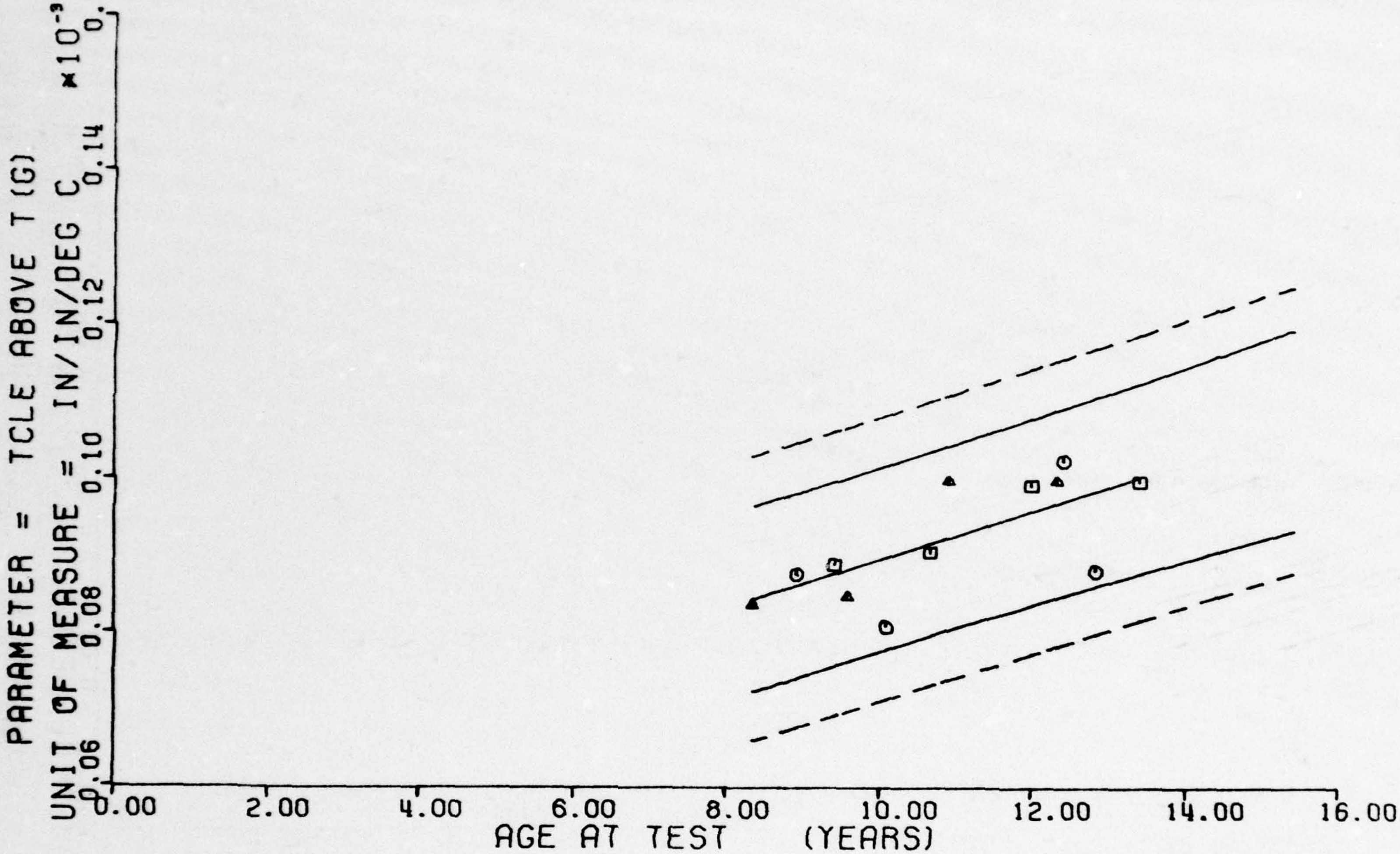
F = +3.5415847E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_1 = +7.9851455E-06

R = +6.4771928E-01 SIGNIFICANCE OF R = SIGNIFICANT S_s = +4.3497946E-08

t = +5.9511215E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +6.1454805E-06

N = 51 DEGREES OF FREEDOM = 49

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSECTED MTRS, INNER, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 46

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
20.0	1	+6.4000000E+01	+0.0000000E+91	+6.4000000E+01	+6.4000000E+01	+6.4671966E+01
27.0	1	+6.1599990E+01	+0.0000000E+95	+6.1599990E+01	+6.1599990E+01	+6.4751937E+01
37.0	1	+6.7699996E+01	+0.0000000E+99	+6.7699996E+01	+6.7699996E+01	+6.4866195E+01
44.0	1	+5.4299987E+01	+0.0000000E+03	+5.4299987E+01	+5.4299987E+01	+6.4946166E+01
59.0	1	+6.2699996E+01	+0.0000000E+07	+6.2699996E+01	+6.2699996E+01	+6.5117538E+01
66.0	1	+6.0299987E+01	+0.0000000E+11	+6.0299987E+01	+6.0299987E+01	+6.5197509E+01
72.0	1	+7.0000000E+01	+0.0000000E+15	+7.0000000E+01	+7.0000000E+01	+6.5266052E+01
82.0	3	+7.0000000E+01	+0.0000000E+19	+7.0000000E+01	+7.0000000E+01	+6.5380310E+01
89.0	3	+6.9666656E+01	+1.5275252E+00	+7.1000000E+01	+6.8000000E+01	+6.5460281E+01
101.0	3	+6.7666656E+01	+1.1547005E+00	+6.9000000E+01	+6.7000000E+01	+6.5597366E+01
120.0	3	+6.0333328E+01	+5.7735026E-01	+6.1000000E+01	+6.0000000E+01	+6.5814437E+01
130.0	8	+6.6750000E+01	+1.0350983E+00	+6.8000000E+01	+6.5000000E+01	+6.5928695E+01
136.0	8	+6.5125000E+01	+6.4086994E-01	+6.6000000E+01	+6.4000000E+01	+6.5997238E+01
143.0	8	+6.5875000E+01	+1.9594095E+00	+6.8000000E+01	+6.3000000E+01	+6.6077209E+01

II STAGE CTN & DSCT MTR,OUTER,HARDNESS,AXIAL POS,MSN=0022135,0022583,0022788

Y = ((+6.7870707E+01) + (-7.5474776E-03) * X)

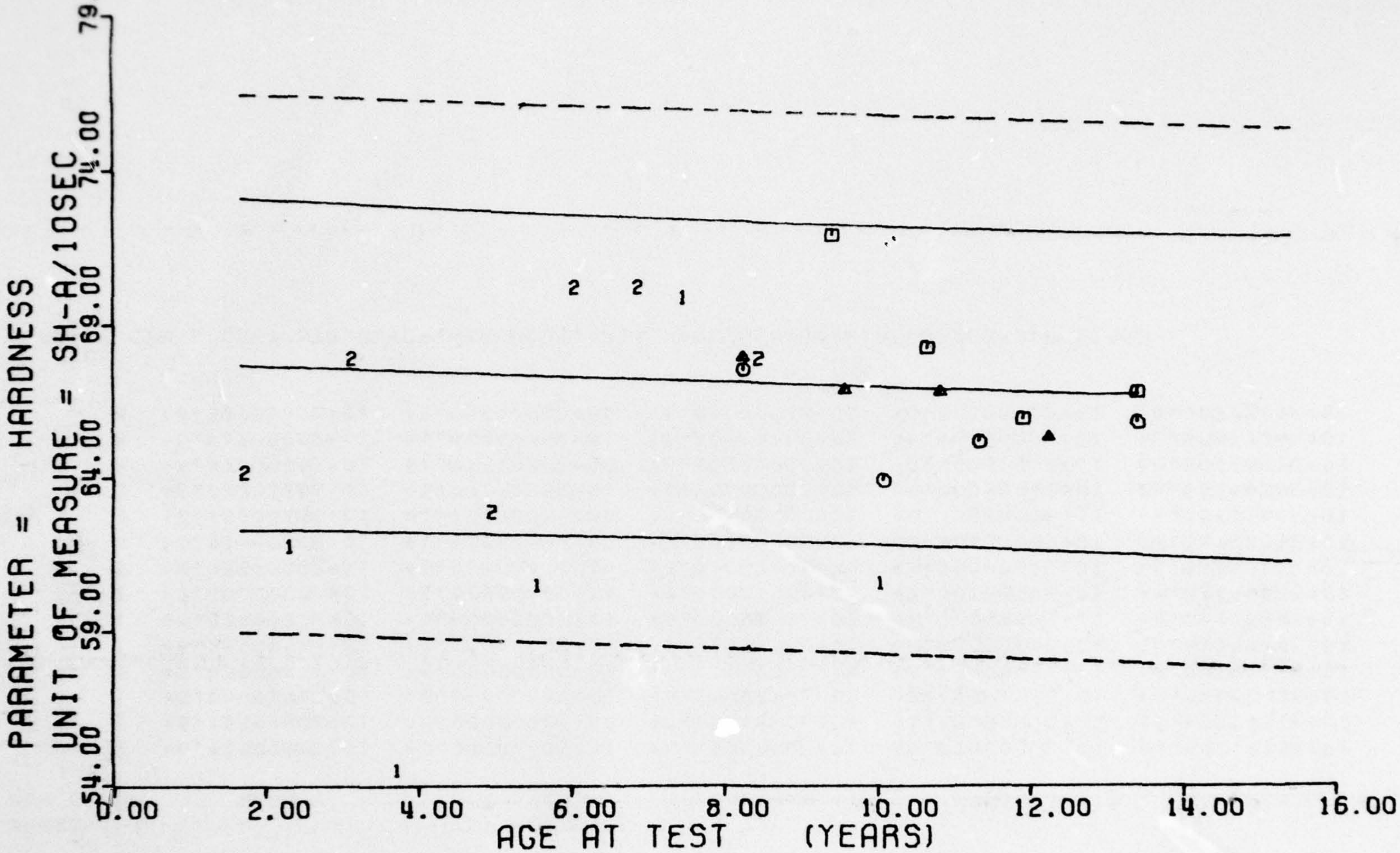
F = +7.0787421E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y= +2.9167533E+00

R = -6.4968272E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a= +8.9706474E-03

t = +8.4135261E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_r= +2.9192925E+00

N = 169 DEGREES OF FREEDOM = 167

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE CTN & DSCT MTR, OUTER, HARDNESS, NON-ORNTO, MSN=0022135, 0022583, 0022788

Figure 47

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
19.0	1	+5.1599990E+01	+0.0000000E+91	+5.1599990E+01	+5.1599990E+01	+4.8327529E+01
36.0	1	+5.7299987E+01	+0.0000000E+95	+5.7299987E+01	+5.7299987E+01	+5.0561950E+01
59.0	1	+5.0699996E+01	+0.0000000E+99	+5.0699996E+01	+5.0699996E+01	+5.3584991E+01
82.0	3	+5.7333328E+01	+5.7735026E-01	+5.8000000E+01	+5.7000000E+01	+5.6608016E+01
101.0	3	+5.2000000E+01	+1.0000000E+00	+5.3000000E+01	+5.1000000E+01	+5.9105300E+01
130.0	8	+6.2125000E+01	+1.2464234E+00	+6.5000000E+01	+6.1000000E+01	+6.2916961E+01
136.0	8	+6.3000000E+01	+7.5592894E-01	+6.4000000E+01	+6.2000000E+01	+6.3705581E+01
143.0	8	+6.7625000E+01	+7.4402380E-01	+6.9000000E+01	+6.7000000E+01	+6.4625625E+01

II STAGE CTN & DSCT MTR.INNER.HARDNESS.AXIAL POS.MSN=0022135.0022583.0022788

Y = ((+5.3752973E+01) + (+7.4668902E-02) * X)

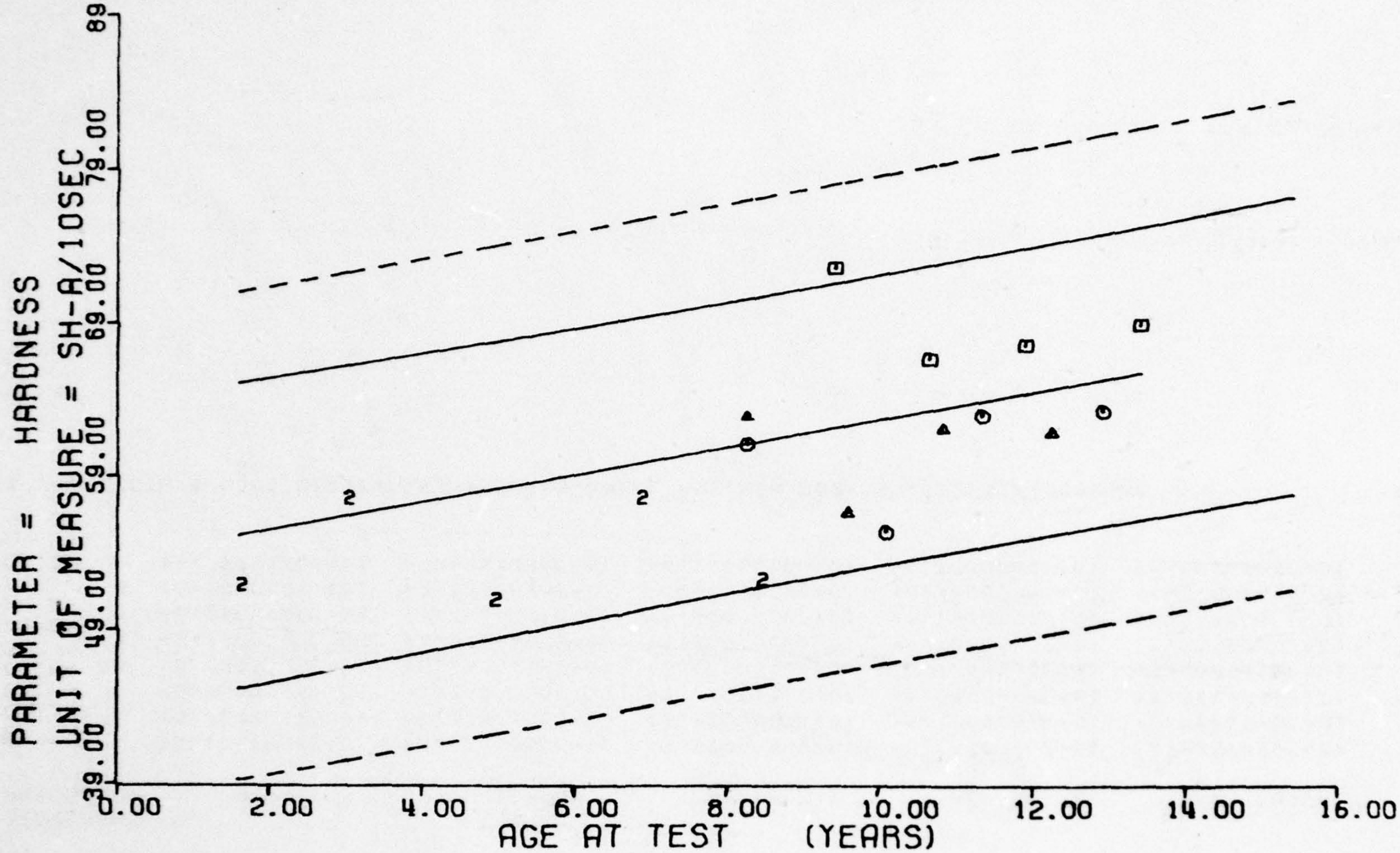
F = +1.7967757E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_1= +5.5525476E+00

R = +3.1337161E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b= +1.7615413E-02

t = +4.2388391E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t= +5.2888232E+00

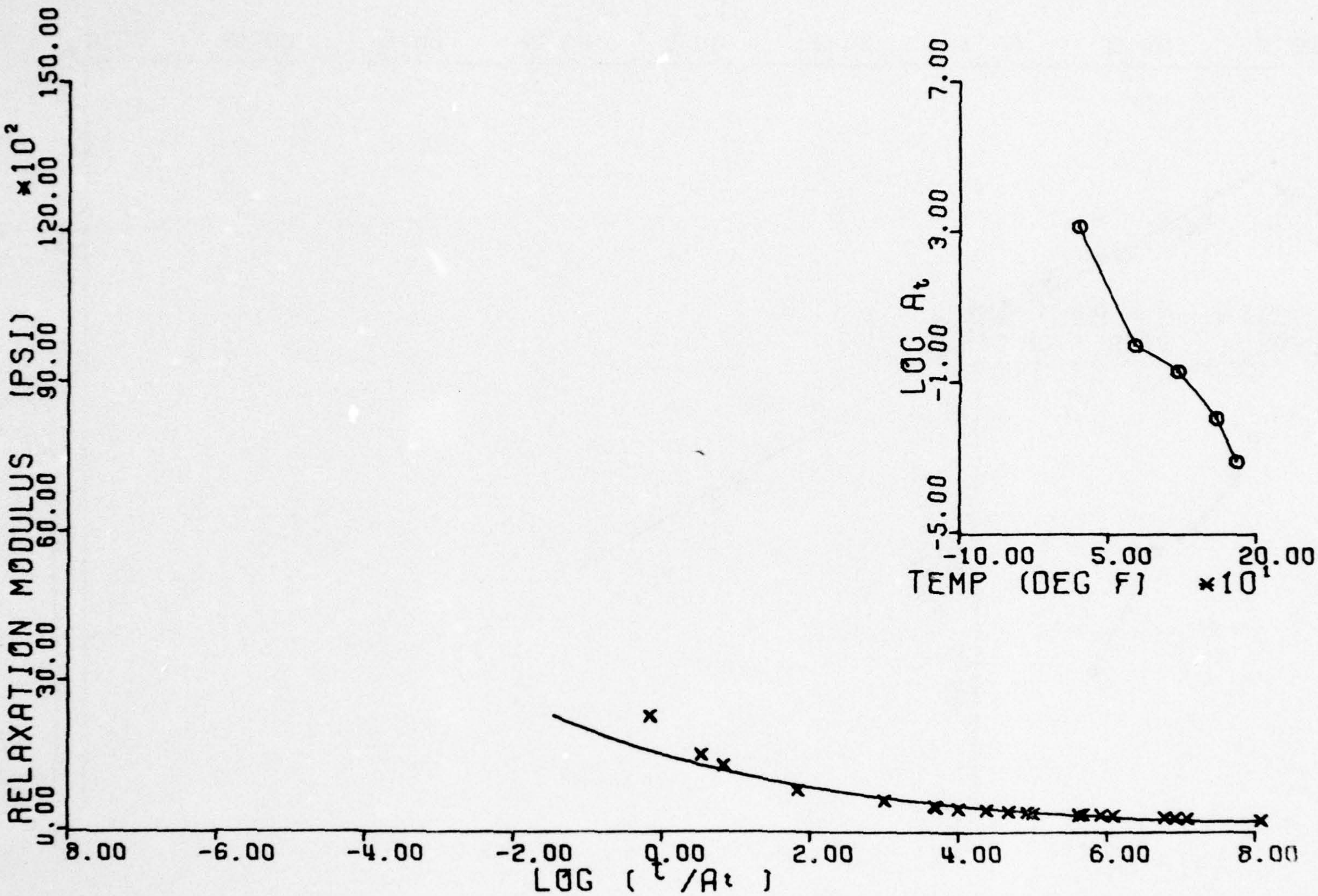
N = 167 DEGREES OF FREEDOM = 165

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



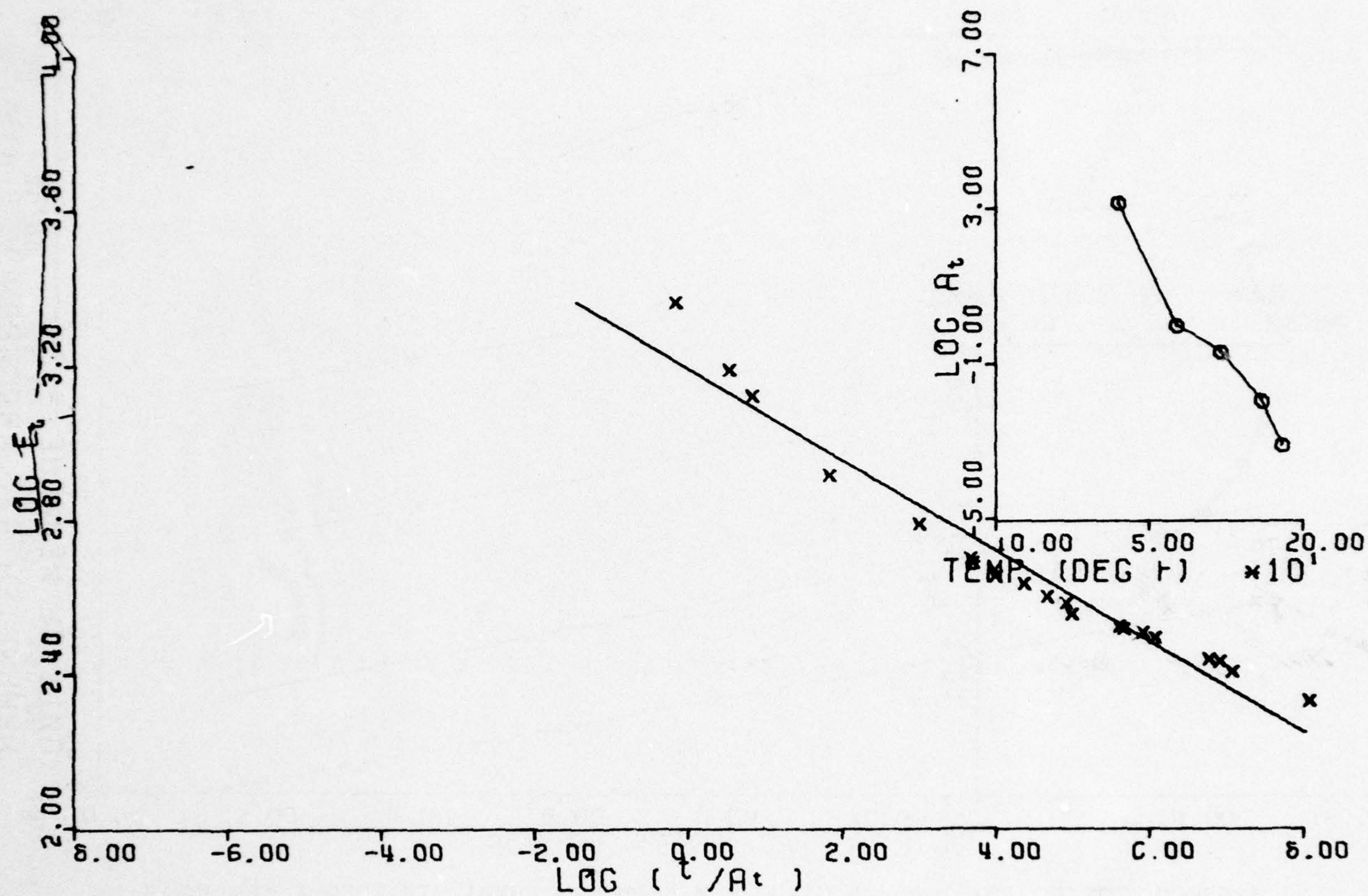
II STAGE CTN & DSCT MTR, INNER, HARDNESS, NON-ORNTO, MSN=0022135, 0022583, 0022788

Figure 48



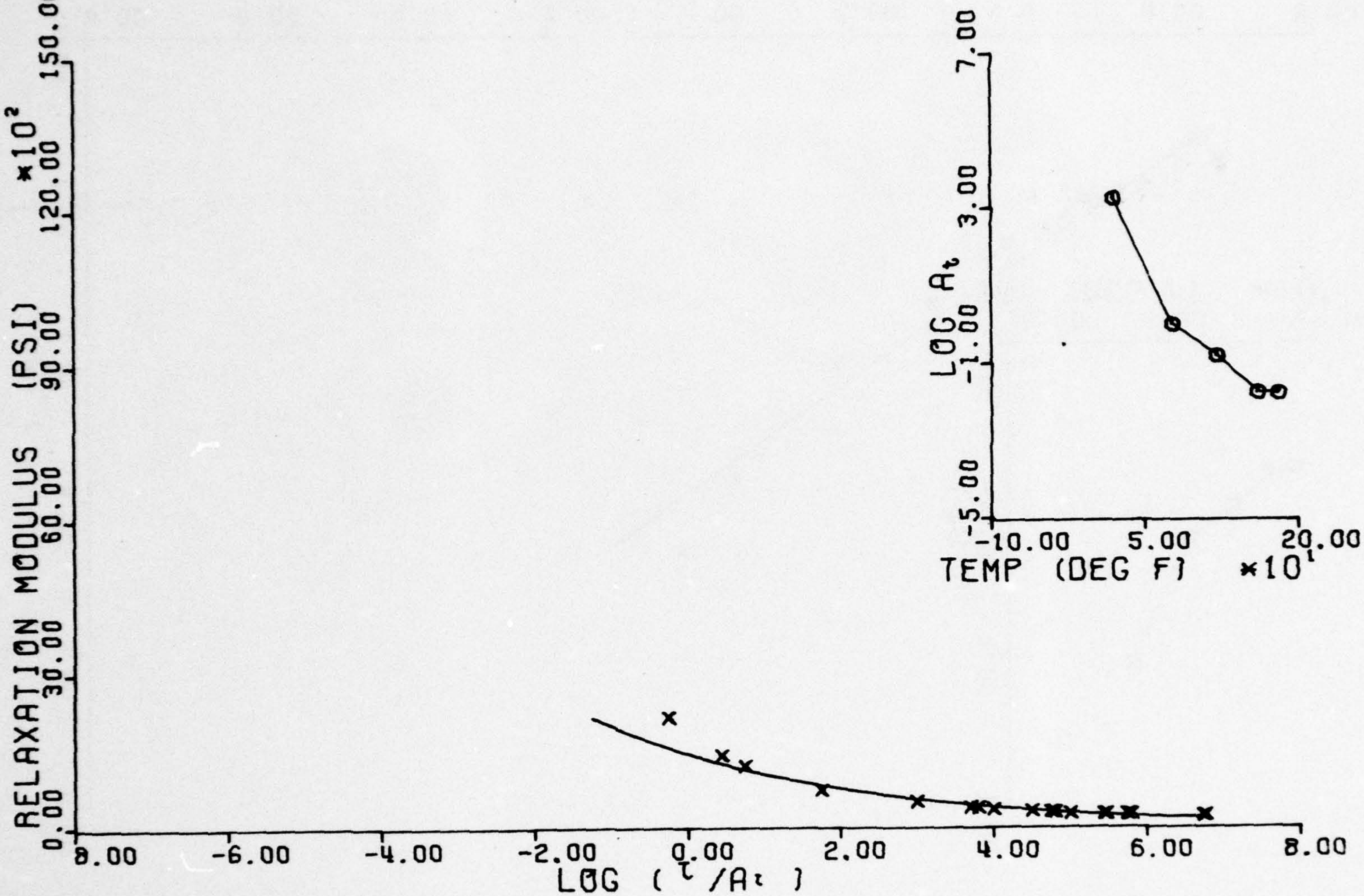
OUTER PROPELLANT STAGE II STRESS RELAXATION MASTER CURVE AT 0.5% STRAIN

Figure 49



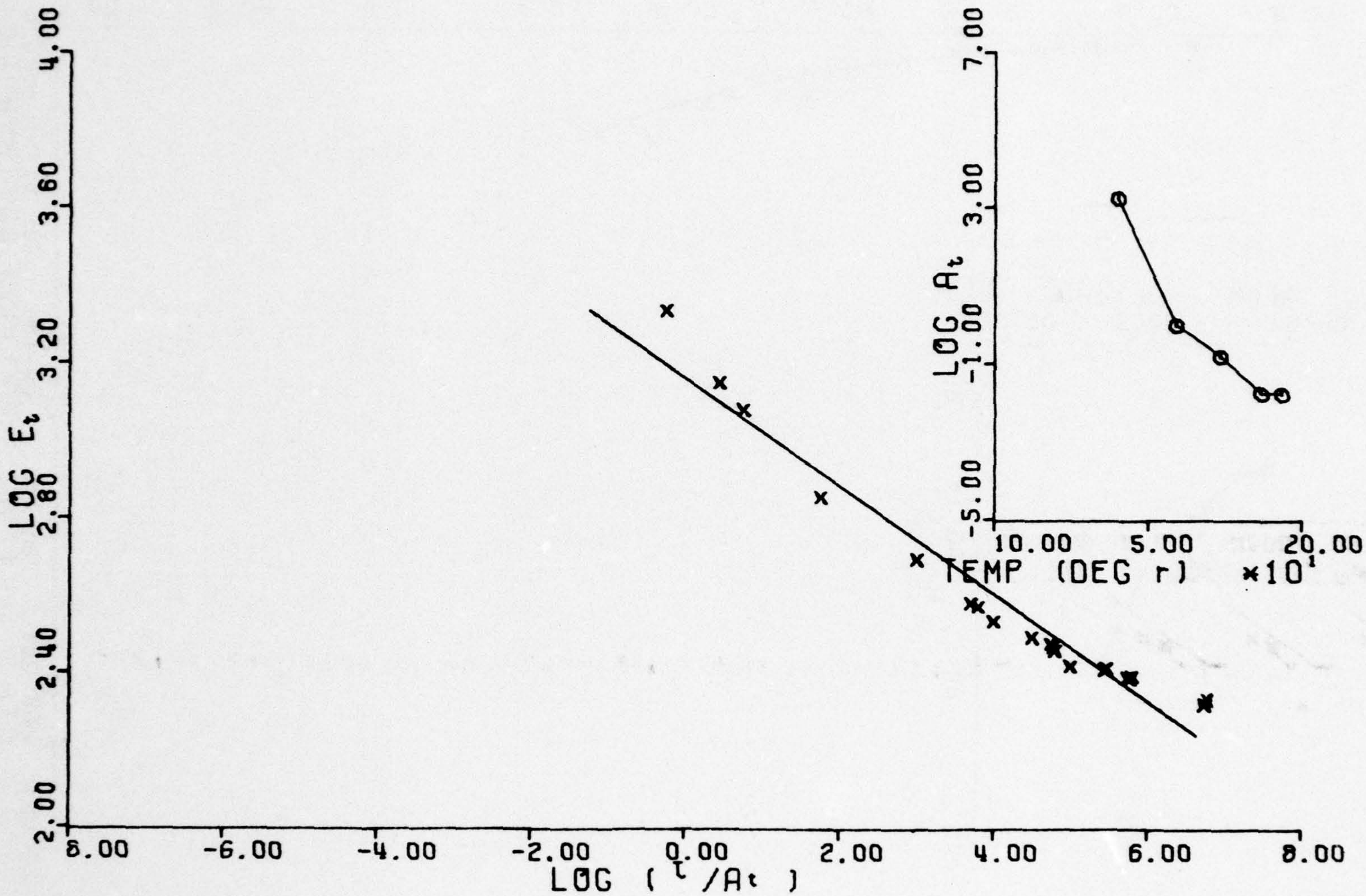
OUTER PROPELLANT STAGE II STRESS RELAXATION MASTER CURVE AT 0.5% STRAIN

Figure 50



INNER PROPELLANT STAGE II STRESS RELAXATION MASTER CURVE AT 0.5% STRAIN

Figure 51



INNER PROPELLANT STAGE II STRESS RELAXATION MASTER CURVE AT 0.5% STRAIN

Figure 52

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Dissected Motor Solid Propellant
Minuteman Safeguard

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report contains test results from propellant and insulation materials obtained from three Minuteman Stage 2 dissected motors and their corresponding propellant cartons. Testing was performed in accordance with Service Engineering General Test Directive GTD -2 Dissect dated 28 June 1974 and Project M83258C.

Statistical analysis includes data from both inner (ANP 2864) and outer (ANP 2862) propellant from the dissected motors and where available, associated propellant cartons. A computer program was utilized to test for common

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populations of individual dissected motors.

Linear regression plots using unique symbols to identify the different relationships between motor and carton data were used to establish general trends. Where a change has taken place and where comparisons could be made, the majority of the regression trend lines are flatter. Therefore, the data are not exceeding the previous sigma limitations. In addition, as more specimens are tested, the trends become more realistic. Most of the test specimens were prepared and tested in the axial orientation, that is, parallel to the longitudinal axis of the motor from which specimens were obtained.

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LGM-30B, Stage II

DISSECTED MOTORS.

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Semiannual TEST REPORT.

Author

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ABSTRACT

This report contains test results from propellant and insulation materials obtained from three Minuteman Stage 2 dissected motors and their corresponding propellant cartons. Testing was performed in accordance with Service Engineering General Test Directive GTD - 2 Dissect dated 28 June 1974 and Project M83258C.

Statistical analysis includes data from both inner (ANP 2864) and outer (ANP 2862) propellant from the dissected motors and where available, associated propellant cartons. A computer program was utilized to test for common populations of individual dissected motors.

Linear regression plots using unique symbols to identify the different relationships between motor and carton data were used to establish general trends. Where a change has taken place and where comparisons could be made, the majority of the regression trend lines are flatter. Therefore, the data are not exceeding the previous sigma limitations. In addition, as more specimens are tested, the trends become more realistic. Most of the test specimens were prepared and tested in the axial orientation, that is, parallel to the longitudinal axis of the motor from which specimens were obtained.

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Title and Report Nr	
Minuteman Stage II Surveillance Quarterly Report Weapon System 133A, Report Nr 214(71)	Jun 1971
Propellant Test Report, LGM-30 A & B Stage II Phase VI Series II, Report Nr 259(72)	Nov 1972
Air Force Contract F42600-72-2002 Aerojet Solid Propulsion Company	1972
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LGM-30 Stage II Dissected Motors Test Report Nr 269(73)	Jun 1973
LGM-30B Stage II Dissected Motors Test Report Nr 338(76)	May 1976
Ten Year Aging and Storage Program, Wings I Through V Minuteman Second-Stage Motors And Components, Aerojet-General Report 0162-01FAS-R	Nov 1967

GLOSSARY OF SYMBOLS AND TERMS

Symbol	Definition
Crosshead Speed	The rate of travel of the crosshead which pulls on a tensile specimen. Dimensions: in/min
CSA	Cross-Sectional Area. Dimensions: in^2
DSC	Differential Scanning Calorimetry
D(t)	Creep Compliance - ratio between strain and stress at a given time following application of a constant stress. Dimensions: in^2/psi
DTA	Differential Thermal Analysis
E	Young's Modulus - ratio between stress (acting to change length) and the strain produced by this stress. It is calculated from a portion of curve where stress and strain are linearly related. Dimensions: lbf/in^2
EGL	Effective Gage Length. Dimensions: in
em	Tensile strain (fractional change in length) at maximum stress. Listed as EM in GO-85. Dimensions: in/in
er	Tensile strain at rupture. Listed as ER in GO-85. Dimensions: in/in
E(t)	Stress Relaxation Modulus--ratio between stress and strain at a given time following application of a constant strain. Dimensions: lbf/in^2
F	The ratio of the sum of the deviations from the regression line to $(S_E)^2$. This calculated value is compared with a table of critical values to determine whether or not the variation from the regression line is significant.
Υ	Cohesive Tear Energy. Dimensions: $lbf - in/in^2$

GLOSSARY OF SYMBOLS AND TERMS (CONT)

Symbol	Definition
JANNAF	Joint Army, Navy, NASA & Air Force Committee
MANCP	Propellant Laboratory Section, Ogden ALC
N	Number of test specimens represented
Ogden ALC	Ogden Air Logistics Center, Air Force Logistics Command
Linear Regression	A line with the general equation $Y = a + bx$ which best represents the trend of the mean test values with respect to time.
R	Linear Correlation Coefficient. It is the slope of the regression line corrected by the standard deviation of x over the standard deviation of y. The calculated value of R is compared with a table of critical values to determine whether or not the correlation of the samples is significant.
Sm	Maximum tensile stress (normal force per unit cross-sectional area). Listed as SM in GO-85, Dimensions: psi
Sr	Tensile stress at rupture. Listed as SR in GO-85, Dimensions: psi
S_y	Standard deviation (square root of variance)
S_B	Standard error of estimate of the regression coefficient.
S_E	Standard deviation of the data about the regression line (also $S_{y.x}$).
Strain Rate	The crosshead speed divided by the EGL. Dimensions: in/in/min
t	The ratio of the slope of the regression line to S_B. The calculated value of t is compared with a table of critical values to determine whether or not the slope of the regression line is significant.

GLOSSARY OF SYMBOLS AND TERMS (CONT)

Symbol	Definition
TCLE	Thermal Coefficient of Linear Expansion. Dimensions: in/in/°C
T_g	Glass Transition Temperature. Dimension: °C
TGA	Thermogravimetric Analysis
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results.
3-Sigma Band	The area between the upper and lower 3-sigma limits. Presuming normal distribution, it can be expected that 99.73% of the inventory represented by the test samples would fall within this range.
90-90 Band	Assuming normal distribution, it can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range.

INTRODUCTION

A. PURPOSE:

1. To provide information on the structural reliability of the propellant and insulation materials in the LGM-30 Stage II Motor in support of the Safeguard Program.

2. To provide age versus physical property trends using statistical analysis as an aid for determining shelf/service life predictions of the motor's propellant.

3. To detect degradation of propellant and insulation materials physical properties due to aging or environmental conditions.

B. BACKGROUND:

Since 1963, materials property testing has been performed on propellant specimens prepared from cartons of propellant used in motor manufacture. Similarly, insulation materials have been tested.

In 1971, all laboratory prepared insulation materials and case to propellant bond specimens were destroyed in a conditioning chamber malfunction. This incident, coupled with near depletion of propellant carton samples, forced a search for other sources of test materials. From a Force Modernization Program, some older motors became available for testing. Three motors were selected as being representative of the inventory and were dissected for testing. The oldest one, Motor S/N 0022135 is 6.9 months older than Motor S/N 0022583 which in turn is 6.2 months older than Motor S/N 0022788. To date, four test periods have been completed at annual intervals. Additional testing cannot be accomplished on Motor S/N 0022583 because all available material have been tested.

C. DISSECTION:

The motors were dissected and cut into segments as shown in Figures 1 thru 5. The sample orientation is shown in Figure 6.

D. SPECIMENS:

The Garlock 7765 peel and lap shear specimens from the forward release area ('Y' joint) are illustrated in Figures 7 and 8 respectively. The case bond shear and tensile specimens are illustrated in Figures 9 and 10 respectively.

E. MOTOR DATA:

Motor Nr	Cast Date	Age at Test
0022135	63162	13.31 years
0022583	64008	12.73 years
0022788	64197	12.21 years

Each of the three motors contain ANP 2862 (Outer) and ANP 2864 (Inner) propellant.

Manufacturer: Aerojet Solid Propulsion Company

STATISTICAL DISCUSSION

Available data from three dissected motors (0022135, 0022583 and 0022788) and corresponding carton data (where available) were statistically analyzed and reported. Using the knowledge that all samples came from the Stage II Propellant Program, it was assumed that for this analysis all data came from a common population with a common variance. To verify this statistical compatibility a representative sampling of the data from separate motors were analyzed for tensile, stress relaxation, and hardness.

The three motors tested in this report do not have the same date of manufacture and the age spread is 13.1 months. By using the analysis of covariance at the 5% significant level, it was possible to test for the null hypothesis of equality of means and compensate for this difference in date of manufacture. The effect due to age was not significant for over one half the representative samples, therefore, aging is not the only biasing factor involved.

In almost all cases, it was found that the different origins of data were not statistically combinable, i.e., the slopes and intercepts (elevations) of the regression trend lines for each group of data indicated that data had multiple biasing factors (Table 34). As a result of this study, it was decided that data from the various origins would be combined in a regression analysis to provide a general population aging trend accepting the fact that individual aging trends of different data groups may be masked.

Individual data points from different time periods were combined to

establish a least squares aging trend line for the overall data. The variance about the regression line, obtained using individual values of the dependent variable, was used to compute a tolerance interval such that at the 90% confidence level 90% of the population falls within this interval. This tolerance interval was extrapolated to a maximum of 24 months to give an indication of the statistical significance of the slope of any aging trends. Data and regression trend lines were plotted utilizing an IBM-360 computer. Because the data is from three separate motors represented by both carton and dissected data, a special plotting program with the ability to use unique symbols to identify the data was used. This method of data plotting allows a visual display of the overall motor-to-motor and motor-to-carton relationships and will provide capability to observe the relationships between the various origins of data and how these different data origins relate to each other. The computed tolerance interval about the composite regression line is wider than what the tolerance interval would be about any individual motor regression line because of the increased data spread introduced by combining different groups of data.

Where data were insufficient to conduct regression analyses, the test data are presented in tables with statistical summaries such as means and standard deviations. To detect any change in the data, the testing that was performed used the null hypotheses that there is no difference between the means (H: $Mean_1 = Mean_2 \ldots Mean_k$).

Where a change has taken place (and comparisons can be made), the majority of the regression trend lines are flatter than those of the last report [NR 338(76)].

The smybols used in the regressions are:

Motor		Motor Symbol	Carton Symbol
0022135	=	□	1
0022583	=	○	2
0022788	=	△	3

INSULATION MATERIALS

Sufficient insulation materials were not available for all scheduled tests. Virtually all available materials were tested and no more tests can be accomplished until another motor is dissected.

A summary of insulation testing is as follows:

A. GARLOCK-7765:

1. Tensile maximum stress data for all three motors range from 2292 psi to 3275 psi as compared with a range of 1862 psi to 2777 psi in both the 1975 and 1972 test periods. The test temperature was 77°F for all insulation testing. The lower failure limit for this test is 315 psi at a test temperature of 60°F. No upper failure limits are given for any insulation materials.

2. The peel strength of Garlock-7765 bonded to the titanium body case for all three motors is about 60 lbs/in of width. This compares to 42 in 1975 and 27 in 1972 for motors 0022135 and 0022788 respectively. The material shows no evidence of brittleness. No failure limits were given.

3. The lap shear strength for the three motors ranges from 372 psi to 658 psi. This compares to a range of 101 psi to 805 psi for the three motors in 1975 and 305 psi to 600 psi for motors 0022135 and 0022788 in 1972. The lower failure limit is 96 psi at 60°F.

4. The lap shear at the 'Y' joint is about 120 psi. No failure limit is given.

B. GEN-GARD V-44:

The tensile maximum stress range is 1332 psi to 1787 psi for the three motors as compared to a range of 1470 psi to 1780 psi for motors 0022135 and 0022788 in 1975 and a range of 1455 psi to 1780 psi for the three motors in 1972. The lower failure limit at 60°F (aft boot release area) is 500 psi.

C. DC-6510:

1. The tensile maximum stress range is from 235 to 1056 psi for all three motors, compared with a range of 525 to 1050 in both 1975 and 1972 for the three motors. The lower failure limit is 7 psi at 80°F.

2. The peel strength range for motors 0022583 and 002788 is 5.8 to 36.7 lbs/in of width compared with a range of 8 to 45 in 1975 and 11 to 39 lbs/in of width in 1972 for the same two motors. No failure limit was given.

3. The lap shear for motors 0022788 and 0022583 has a range of 16 to 120 psi, compared with a range of 41 to 119 psi in 1975 and 58 to 139 psi in 1972 for the same motors. The lower failure limit at 80°F is 4.8 psi.

D. AVCOAT II:

The tensile maximum stress range is 448 to 1624 psi for motors 0022135 and 0022788 compared with a range of 257 to 600 psi for the same motors in 1975. The lower limit at 80°F is 270 psi. All failure limits are from Aerojet-General Report 0162-10FAS-R.

The above test results, especially when compared with known lower failure limits, indicate no motor operational failures in the near future due to insulation failure.

TEST RESULTS

A. UNIAXIAL TENSILE:

The regressions generally have a flatter slope than the previous test period. In the few exceptions that do have steeper slopes,the increases are small. All of the results are statistically significant (Figures 11 thru 22). Raw data are contained on Tables 1 thru 5. For covariance analysis,see Tables 35 thru 46.

B. BIAXIAL TENSILE:

Some of the regressions have a flatter slope than previously. Slightly more than half of the test results have a non significant slope. (Figures 23 thru 28). Raw data are contained on Tables 6 and 7. For covariance analysis, see Tables 47 thru 52.

C. HIGH RATE TRIAXIAL TENSILE:

The regressions for this test parameter are presented for the first time using two time periods which does not provide sufficient data for definitive or realistic conclusions. The maximum stress regression lines are not significant. The strain at rupture for both outer and inner propellant shows a statistically significant increasing slope (Figures 29 thru 34). Raw data are contained on Tables 8 and 9. For covariance analysis, see Tables 53 thru 58.

D. HIGH RATE HYDROSTATIC TENSILE:

The regressions for this test parameter are also presented for the first time using only two time periods. The maximum stress and modulus for both inner and outer propellant has a non significant slope. The trend line for the inner strain at rupture has a small negative and the outer a small positive slope. Raw data are contained on Tables 10 and 11

and multi symboled regressions in Figures 35 thru 40.

E. BURNING RATE:

The regression for inner propellant at 500 psi initial pressure has a flatter slope than previously. No new data for outer propellant is available (Figures 41 and 42). Raw data are contained on Tables 16 and 17.

F. TCLE (THERMAL COEFFICIENT OF LINEAR EXPANSION):

The regressions below the glass point show a statistically significant decrease while TCLE above the glass point shows an increase in the trend lines. (Figures 43 thru 46). Raw data are contained on Tables 18 and 19.

The expansion rate of propellant increases with temperature both below and above the glass point (Tg). Because of this, the TCLE varies considerably depending on the temperature range used and test results are not directly comparable except for identical temperature ranges. To make direct comparisons possible, equations of the TCLE curves related to the current test period are included in this report.

The TCLE is represented by the equation:

$$\text{TCLE} = \frac{\Delta L/L}{\Delta T}$$

Where: L = Specimen length, inches

ΔL = Change in length, inches

ΔT = Change in temperature, °C

TCLE is recorded from a preconditioned specimen in the Thermal Mechanical Analyzer as the temperature is raised from -120°C to 0°C. A change in expansion rate occurs at the glass point and since the TCLE

is not linear either below or above the glass point, two-third order equations, one below and one above the glass point were derived to describe the TCLE for each test specimen tested in the current test period (see Table 19 for TCLE equations). Newton's method of divided differences was used to derive the equations. The equations may be used to determine the TCLE at any given temperature range for a specific specimen. In the derived equations for the TCLE curves, X represents degrees celsius and Y the proportional change in specimen length. Use of the equations to determine a TCLE value is accomplished as follows:

1. Determine two Y values separately by entering the two temperatures representing the range desired in the equation for a specific specimen.

2. Determine the change in length in inches by multiplying the difference between the Y values obtained by a test instrument constant of 0.0005.

3. The change in length obtained is then the ΔL value to be used in the TCLE formula.

EXAMPLE:

Range desired = $-50^{o}C$ to $-10^{o}C$

Y_1= as determined by substituting $-10^{o}C$ in the appropriate equation

Y_2 = as determined by substituting $-50^{o}C$ in the same equation

L = as listed by each equation

$$\text{TCLE} = \frac{(0.0005)(Y_1 - Y_2)\ /L}{40^{o}C}$$

G. HARDNESS:

The regressions for outer propellant show a non significant trend. The inner propellant hardness regression trend line has a flatter slope than in the previous report (Figures 47 and 48). Raw data are contained on Table 20. For covariance analysis see Tables 67 and 68.

H. STRESS RELAXATION MASTER CURVE AT 0.5% STRAIN:

The relaxation modulus results at -65° and -40°F were not used in the master curves because in most cases they were above the programmed capacity of the plotter.

The high modulus is probably due to the fact that, in most cases, -65°F is close to the glass point of the propellant. Apparently at -40°F there is enough of the crystallinity that characterizes the glassy region to cause a high modulus. The master stress-strain curves are shown in Figures 49 thru 52. The covariance analysis are contained on Tables 59 thru 66.

I. ADDITIONAL TESTING:

Additional raw data on propellant and insulation materials is included where data were not available for regression analyses. Raw data are contained on Tables 12 thru 15 and 21 thru 25 for propellant and Tables 26 thru 33 for insulation materials.

CONCLUSIONS

Test results from any one of the three dissected motors cannot be pooled with results from the same test, from either of the other motors, or from their carton propellant without masking individual data trends.

The three motors have approximately equal inconsistency. Motor Numbers 0022135, 0022583 and 0022788 are inconsistent 4, 5, and 6 times respectively in 26 regressions having three or more test periods for all three motors.

The inclusion of carton propellant data (where available) in regressions with dissected motor data provided good visibility in displaying the relationship of various age groups to each other. Although a statistical trend line was not plotted for individual motor carton data an indication of group trends occurring with time may be found from the composite regressions.

Where data from four test periods is available, individual motor trends are readily evident by visual examination of the regressions. When data from three test periods is available,the individual trends are not readily evident in some tests. No attempt was made to visually evaluate the regressions when data from two test periods were available.

The visual examination of the regressions as detailed above does not indicate that any serious aging problems will occur in the near future.

The insulation materials test results, especially when compared with known lower failure limits, indicate no motor operational failures in the near future due to insulation failure.

RECOMMENDATIONS

It is recommended that:

1. The additional motor scheduled for testing be dissected immediately so it can replace Motor Nr 0022583 in the testing program. There is not sufficient case bond or insulation material or propellant remaining from Motor 0022583 for additional testing. Data from at least three motors are required to reasonably well represent the inventory.

2. Testing be continued on the case bond and insulation material and propellant as part of the LGM-30 Safeguard Program.

TABLE 1

LOW AND VERY LOW RATE TENSILE
(GROUPED)
(AXIAL POSITION)

(OUTER)

MOTOR S/N	X-HEAD SPEED In/Min	TEST TEMP °F	AGE AT TEST MO	MO	MAXIMUM STRESS MEAN	MAXIMUM STRESS S	STRAIN AT RUPTURE MEAN	STRAIN AT RUPTURE S	MODULUS MEAN	MODULUS S
0022135	0.002	+077	160	3	50.8	1.78	0.32432	0.0038	395.67	31.97
			167	3	48.5	0.32	0.29866	0.0302	417.67	5.86
	0.02	+077	161	3	64.7	5.24	0.35749	0.0309	542.67	96.84
		+120	161	3	48.3	0.30	0.28756	0.0052	426.67	24.21
	0.2	+020	161	6	206.5	14.67	0.47302	0.1113	2115.8	191.85
		+077	161	3	86.4	3.77	0.41182	0.7870	759.33	52.54
	2.0	+077	161	3	113.01	1.76	0.46916	0.03947	1152.0	73.98
	20.0	+020	161	3	410.4	18.93	0.35269	0.0556	5020.0	184.79
0022583	0.0002	+077	155	3	43.5	0.63	0.21599	0.0590	303.0	30.64
	0.002	+120	160	3	38.9	1.29	0.24799	0.0104	279.0	13.89
	0.02	+077	155	3	90.8	0.6316	0.29256	0.0097	417.0	10.583
	0.2	+020	155	3	102.19	8.269	0.48609	0.0297	218.13	6.376
		+077	155	3	87.65	7.635	0.39616	0.2476	721.0	69.48
	2.0	+020	155	3	137.15	5.172	0.52956	0.0415	3678.7	315.32
		+077	155	3	142.1	8.128	0.49729	0.0024	1076.7	91.88
	20.0	+020	155	3	188.8	2.03	0.44269	0.0162	4178.0	94.32
0022788	0.0002	+077	149	3	52.14	1.67	0.17019	0.008	421.3	66.06
	0.002	+077	153	3	62.82	1.11	0.29359	0.0168	439.67	24.42
	0.002	+077	154	3	62.80	0.623	0.28832	0.0179	451.7	20.55
	0.02	+077	148	3	71.80	2.9206	0.42599	0.0557	499.7	91.95
		+120	148	3	58.736	0.46	0.37626	0.0426	352.7	31.39
	0.2	+020	148	3	225.34	3.354	0.42959	0.0129	2967.3	33.23
		+077	148	3	92.75	1.095	0.42192	0.2561	767.3	104.21
	2.0	+020	148	3	290.7	8.22	0.47885	0.023	4327.3	169.5
		+077	148	3	129.69	2.67	0.5340	0.032	970.0	66.8
	20.0	+020	148	3	400.35	4.56	0.35232	0.0197	4541.7	55.52

TABLE 2

LOW AND VERY LOW RATE
DISSECTED MOTOR TENSILE
(OUTER) (AXIAL POSITION)

MSN	X-HEAD SPEED (In/Min)	TEST TEMP (°F)	TEST DATE	ATT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022135	0.002	+077	77110	160	50.000	0.32599	361.00
					49.500	0.31999	424.00
					52.799	0.32699	402.00
			77119	167	48.129	0.27599	411.00
					48.469	0.33299	420.00
					48.759	0.28699	422.00
	0.02	+077	76314	161	63.799	0.33969	528.00
					70.329	0.33959	646.00
					59.959	0.39319	454.00
		+120	76320	161	48.000	0.28829	399.00
					48.299	0.28199	444.00
					48.589	0.29239	437.00
	0.2	+020	76317	161	194.20	0.57339	1989.0
					222.85	0.44539	2249.0
					224.43	0.28509	2341.0
					190.62	0.58529	1834.0
					209.03	0.43469	2238.0
					197.78	0.51429	2044.0
		+077	76315	161	82.409	0.45949	703.00
					87.009	0.45499	768.00
					89.889	0.32099	807.00
	2.0	+077	76315	161	113.09	0.42359	1128.0
					114.72	0.49129	1235.0
					111.21	0.49259	1093.0
	20.0	+020	76317	161	425.23	0.32109	5153.0
					416.90	0.32009	5098.0
					389.08	0.41689	4809.0
0022583	0.0002	+077	76342	155	44.099	0.18599	325.00
					43.639	0.17799	316.00
					42.859	0.28399	268.00
	0.002	+120	77117	160	37.519	0.23599	263.00
					40.039	0.25499	286.00
					39.239	0.25299	288.00
	0.02	+077	76349	155	90.279	0.36819	668.0
					90.609	0.37709	661.0
					91.500	0.36899	645.0
	0.02	+120	76343	155	55.309	0.29309	413.0
					56.000	0.30199	409.0
					57.519	0.28259	429.0
	0.2	+020	76344	155	96.639	0.51629	225.0
					111.69	0.45689	217.0
					98.229	0.48509	212.4
	0.2	+077	76349	155	79.389	0.11109	798.0
					89.109	0.55809	702.0
					94.449	0.51929	663.0
	2.0	+020	76344	155	133.09	0.56549	3348.0

TABLE 2 (cont)

LOW AND VERY LOW RATE
DISSECTED MOTOR TENSILE
(OUTER) (AXIAL POSITION)

MSN	X-HEAD SPEED (In/Min)	TEST TEMP (°F)	TEST DATE	ATT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022583	2.0	+020	76344	155	142.97	0.48419	3712.0
					135.38	0.53899	3976.0
	2.0	+077	76349	155	135.62	0.50009	972.00
					151.22	0.49609	1144.0
					139.46	0.49569	1114.0
	20.0	+020	76344	155	188.69	0.42439	4154.0
					186.81	0.45499	4098.0
					190.86	0.44869	4282.0
0022788	0.0002	+077	76342	149	51.469	0.16999	418.00
					50.899	0.17799	357.00
					54.039	0.16259	489.00
	0.002	+077	77110	153	63.199	0.30079	420.00
					63.699	0.27439	467.00
					61.569	0.30559	432.00
	0.002	+077	77119	154	62.099	0.30899	428.00
					62.989	0.27799	465.00
					63.299	0.27799	462.00
	0.02	+077	76310	148	71.399	0.41299	524.00
					74.899	0.37799	577.00
					69.099	0.48699	398.00
	0.02	+120	76324	148	58.250	0.32709	388.00
					59.169	0.40279	328.00
					58.789	0.39889	342.00
	0.2	+020	76317	148	226.10	0.42939	2985.0
					221.68	0.44259	2988.0
					228.26	0.41679	2929.0
	0.2	+077	76308	148	91.549	0.41499	647.00
					93.689	0.40049	828.00
					93.019	0.45029	827.00
	2.0	+020	76317	148	282.23	0.49439	4224.0
					298.64	0.45219	4235.0
					291.31	0.48849	4523.0
	2.0	+077	76309	148	126.62	0.51269	896.00
					131.44	0.57029	988.00
					131.01	0.51889	1026.0
	20.0	+020	76317	148	396.08	0.35479	4478.0
					399.82	0.33149	4580.0
					405.15	0.37069	4567.0

TABLE 3

LOW AND VERY LOW RATE TENSILE
GROUPED
DISSECTED MOTOR (INNER)
(AXIAL POSITION)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	AAT	NO.	MAXIMUM STRESS MEAN	MAXIMUM STRESS S	STRAIN AT RUPTURE MEAN	STRAIN AT RUPTURE S	MODULUS MEAN	MODULUS S
0022135	0.02	+120	161	3	66.8	3.06	0.291	0.007	433.7	22.28
	0.2	+077	161	3	122.6	0.85	0.401	0.018	736.3	35.23
	2.0	+020	162	5	352.1	68.12	0.251	0.066	4562.8	618.1
		+077	161	3	160.6	3.80	0.465	0.031	1049.7	72.1
0022583	0.2	+077	155	3	102.2	1.91	0.538	0.057	427.7	12.7
	2.0	+020	155	3	305.6	4.69	0.465	0.074	2596.0	68.43
		+077	155	3	128.7	6.46	0.665	0.062	640.0	11.0
0022788	0.02	+120	148	3	58.4	0.31	0.354	0.023	281.7	4.93
	0.2	+077	148	3	101.5	1.28	0.510	0.020	459.3	17.79
	2.0	+020	149	3	351.0	8.58	0.346	0.030	4077.0	286.7
		+077	148	3	130.9	4.50	0.612	0.022	682.3	16.5

TABLE 4

LOW AND VERY LOW RATE
DISSECTED MOTOR TENSILE
(AXIAL POSITION)

(INNER)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022135	0.02	+120	76329	161	64.979	0.29019	445.00
					65.019	0.29789	408.00
					70.299	0.28409	448.00
	0.2	+077	76328	161	121.77	0.38029	769.00
					123.47	0.41549	699.00
					122.68	0.40639	741.00
	2.0	+020	76358	162	384.53	0.21459	4850.0
					389.85	0.22879	5139.0
					382.16	0.17539	4889.0
					373.15	0.29659	4355.0
					230.69	0.33889	3581.0
		+077	76328	161	163.05	0.46099	1019.0
					162.47	0.43559	1132.0
					156.19	0.49809	998.0
0022583	0.2	+077	76350	155	102.25	0.51419	436.00
					100.25	0.49739	413.00
					104.06	0.60369	434.00
	2.0	+020	76344	155	305.00	0.42349	2609.0
					310.58	0.55029	2657.0
					301.25	0.42059	2522.0
		+077	76350	155	136.10	0.59439	640.0
					126.16	0.71189	629.0
					123.97	0.68829	651.0
0022788	0.02	+120	76329	148	58.329	0.32989	276.00
					58.209	0.35879	284.00
					58.789	0.37439	285.00

TABLE 4 (cont)

LOW AND VERY LOW RATE
DISSECTED MOTOR TENSILE
(AXIAL POSITION)

(INNER)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022788	0.2	+077	76328	148	100.35	0.53179	440.00
					101.39	0.50609	475.00
					102.89	0.49179	463.00
	2.0	+020	76358	149	346.25	0.31189	3911.0
					360.88	0.36609	4408.0
					345.81	0.36069	3912.0
		+077	76328	148	128.79	0.59149	696.0
					136.07	0.63599	687.0
					127.84	0.60959	664.0

TABLE 5

BI-PROPELLANT TENSILE
DISSECTED MOTORS
(NON-ORIENTED)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022135	0.0002	+077	76342	161	39.669	0.19499	319.00
					35.289	0.17699	296.00
					36.289	0.16259	321.00
					35.789	0.18299	306.00
				...Mean/S=	37.1/2.30	0.178/0.016	312.0/13.89
	0.2	+077	75171	144	89.159	0.33899	710.00
					93.149	0.33019	833.00
					89.919	0.33019	913.00
				...Mean/S=	90.7/2.12	0.336/0.005	818.7/102.3
	0.2	+077	76327	161	87.179	0.33759	680.00
					83.569	0.33639	592.00
					80.949	0.36109	537.00
				...Mean/S=	83.9/3.13	0.345/0.014	603.0/72.1
	2.0	+020	75189	145	257.69	0.34209	2628.0
					259.85	0.34369	2630.0
					291.72	0.28779	3174.0
				...Mean/S=	269.8/19.05	0.325/0.032	2810.7/314.66
	2.0	+020	76327	161	286.28	0.29709	3798.0
					285.78	0.28499	3729.0
					277.55	0.28729	3436.0
				...Mean/S=	283.2/4.90	0.290/0.006	3654.3/192.2
	2.0	+077	75171	144	129.50	0.36509	1050.0
					131.44	0.39679	911.00
					133.02	0.37459	1082.0
				...Mean/S=	131.3/1.76	0.379/0.016	1014.3/90.9

TABLE 5 (cont)

BI-PROPELLANT TENSILE
DISSECTED MOTORS
(NON-ORIENTED)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
	2.0	+077	76327	161	119.31	0.37959	1103.0
					126.05	0.36529	1188.0
					119.52	0.36379	1092.0
				...Mean/S=	121.6/3.83	0.370/0.009	1127.7/52.6
	20.0	+020	76317	160	384.42	0.23139	4579.0
					390.91	0.25889	4700.0
				...Mean/S=	387.7/4.59	0.245/0.019	4639.5/85.6
0022583	0.0002	+077	76342	155	42.489	0.27099	206.00
					44.199	0.26599	217.00
					42.159	0.27199	211.00
				...Mean/S=	42.9/1.10	0.270/0.003	211.3/5.51
	0.2	+077	75171	137	85.329	0.61459	631.00
					84.949	0.43809	726.00
					88.339	0.39999	543.00
				...Mean/S=	86.2/1.86	0.484/0.114	633.3/91.5
	0.2	+077	76350	155	91.189	0.40979	457.00
					84.159	0.38889	415.00
					91.519	0.40699	457.00
				...Mean/S=	89.0/416	0.402/0.011	443.0/24.25
	2.0	+020	75189	138	244.25	0.55699	2644.0
					247.25	0.60549	2297.0
					249.31	0.54679	2783.0
				...Mean/S=	246.9/2.54	0.570/0.031	2574.7/250.3

TABLE 5 (cont)

BI-PROPELLANT TENSILE
DISSECTED MOTORS
(NON-ORIENTED)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
	2.0	+020	76344	155	121.87	0.36039	2440.0
					126.37	0.40759	2268.0
					132.25	0.40449	2396.0
				...Mean/S=	126.8/5.21	0.391/0.026	2368.0/89.4
	2.0	+077	75171	137	112.71	0.77459	575.00
					111.58	0.76509	553.00
					114.89	0.80940	559.00
				...Mean/S=	113.1/1.68	0.783/0.023	562.3/11.4
	2.0	+077	76349	155	117.47	0.39559	695.00
					119.97	0.43919	713.00
					125.15	0.49349	716.00
				...Mean/S=	120.9/3.92	0.443/0.049	708.0/11.4
	20.0	+020	76344	155	183.76	0.32989	4100.0
					178.05	0.33069	3910.0
					179.30	0.30859	3878.0
				...Mean/S=	180.4/3.00	0.330/0.001	3962.7/120.0
0022788	0.0002	+077	76342	149	62.139	0.28499	378.00
					50.019	0.31399	320.00
					51.500	0.33999	313.00
				...Mean/S=	54.6/6.61	0.313/0.028	337.0/35.7
	0.2	+077	75171	131	94.959	0.45589	695.00
					89.539	0.41139	744.00
					95.029	0.41399	880.00
				...Mean/S=	93.18/3.15	0.427/0.025	773.0/95.8

TABLE 5 (cont)

BI-PROPELLANT TENSILE
DISSECTED MOTORS
(NON-ORIENTED)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022788	0.2	+077	76350	149	116.56	0.47379	645.00
					114.07	0.42799	602.00
					110.60	0.43669	540.00
				...Mean/S=	113.7/3.00	0.446/0.024	595.7/52.8
	2.0	+020	75189	132	268.65	0.43789	3276.0
					275.00	0.32599	3052.0
					263.67	0.35529	3553.0
					273.46	0.34119	3297.0
				...Mean/S=	270.2/5.12	0.365/0.050	3294.5/204.9
	2.0	+020	76344	149	147.81	0.32729	2940.0
					139.76	0.35309	2564.0
					151.06	0.31609	2996.0
				...Mean/S=	146.2/5.82	0.332/0.019	2833.3/234.9
	2.0	+077	75171	131	132.12	0.51429	829.00
					128.96	0.56189	852.00
					139.43	0.43809	924.00
					129.59	0.46099	933.00
				...Mean/S=	132.5/4.80	0.494/0.055	884.5/51.8
	2.0	+077	76349	149	144.80	0.52949	946.00
					145.67	0.53529	943.00
					142.00	0.51909	879.00
				...Mean/S=	144.2/1.92	0.528/0.008	922.7/37.8
	20.0	+020	76317	148	386.33	0.31309	4578.0
					398.32	0.26989	4882.0
				...Mean/S=	392.3/8.48	0.291/0.031	4730.0/215.0

TABLE 6

LOW RATE BIAXIAL
DISSECTED MOTOR TENSILE
(AXIAL POSITION)

(OUTER)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022135	0.02	+120	76329	161	55.379	0.20599	502.00
					56.539	0.20149	538.00
					56.129	0.20709	464.00
				...Mean/S =	56.0/0.59	0.205/0.003	501.3/37.0
	0.2	+077	76328	161	92.919	0.33439	788.00
					85.439	0.38229	602.00
					101.02	0.31599	864.00
				...Mean/S=	93.1/7.79	0.344/0.034	751.3/134.8
	2.0	+020	76358	162	375.51	0.23029	4805.0
					383.50	0.22889	5020.0
					374.78	0.24289	4171.0
					374.78	0.21449	4527.0
				...Mean/S=	377.1/4.25	0.229/0.012	4630.8/367.0
	2.0	+077	76328	161	126.09	0.42109	1114.0
					127.21	0.39619	1094.0
					133.07	0.35559	1186.0
				...Mean/S=	128.8/3.75	0.391/0.033	1131.3/48.4
0022583	0.0002	+120	75318	142	44.059	0.23059	267.00
	0.2	+077	76350	155	87.549	0.45359	698.00
					95.659	0.39089	725.00
					96.449	0.34369	745.00
				...Mean/S=	93.2/4.93	0.396/0.055	722.7/23.6
	2.0	+020	76344	155	316.42	0.30069	3295.0
					315.75	0.30909	3003.0
					309.25	0.29289	3240.0
				...Mean/S=	313.8/3.96	0.301/0.008	3179.3/155.2
	2.0	+077	76350	155	125.13	0.43789	1027.0
					113.37	0.54439	993.00
					135.56	0.49849	1087.0
				...Mean/S=	124.7/11.10	0.494/0.053	1035.7/47.6
0022788	0.0002	+120	75297	135	57.599	0.00000	336.00
	0.02	+120	76331	148	61.699	0.23769	534.00
					59.159	0.27109	418.00
					60.829	0.24939	470.00
				...Mean/S=	60.6/1.29	0.253/0.017	474.0/58.1

TABLE 6 (cont)

LOW RATE BIAXIAL
DISSECTED MOTOR TENSILE
(AXIAL POSITION)

(OUTER)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	ATT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
	0.2	+077	76328	148	102.72	0.35909	751.00
					109.63	0.37619	820.00
				...Mean/S=	106.2/4.89	0.368/0.012	785.5/48.8
	2.0	+020	76358	149	362.07	0.22789	5080.0
					359.55	0.20589	4530.0
					358.08	0.29389	5103.0
				...Mean/S=	359.9/2.02	0.243/0.046	4904.3/324.4
	2.0	+077	76328	148	141.43	0.49569	1061.0
					140.93	0.43289	1127.0
					133.86	0.48729	876.00
				...Mean/S=	138.7/4.23	0.472/0.034	1021.3/130.1

TABLE 7

LOW RATE BIAXIAL
DISSECT MOTOR TENSILE
(AXIAL POSITION)

(INNER)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022135	0.02	+120	76329	161	64.979	0.29019	445.00
					65.019	0.29789	408.00
					70.299	0.28409	448.00
				...Mean/S=	66.8/3.06	0.291/0.007	433.7/22.3
	0.2	+077	76328	161	121.77	0.38029	769.00
					123.47	0.41549	699.00
					122.68	0.40639	741.00
				....Mean/S=	122.6/0.85	0.401/0.018	736.3/35.2
	2.0	+020	76358	162	384.53	0.21459	4850.0
					389.85	0.22879	5139.0
					382.16	0.17539	4889.0
					373.15	0.29659	4355.0
					230.69	0.33889	3581.0
				...Mean/S=	352.1/68.1	0.251/0.066	4562.8/618.1
	2.0	+077	76328	161	163.05	0.46099	1019.0
					162.47	0.43559	1132.0
					156.19	0.49809	998.00
				... Mean/S=	160.6/3.80	0.465/0.031	1049.7/72.1
0022583	0.2	+077	75125	136	111.43	0.48059	516.00
					121.77	0.49909	562.00
					113.63	0.5019	448.00
				...Mean/S=	115.6/5.45	0.49/0.011	508.7/57.4
	0.2	+077	76350	155	102.25	0.51419	436.00
					100.25	0.49739	413.00
					104.06	0.60369	434.00
				...Mean/S=	102.2/1.91	0.538/0.057	427.7/12.7
	2.0	+020	76344	155	301.25	0.42059	2522.0
					305.00	0.42349	2609.0
					310.58	0.55029	2657.0
				...Mean/S=	305.6/4.69	0.465/0.074	2596.0/68.4
	2.0	+077	76350	155	123.97	0.68829	651.00
					136.10	0.59439	640.00
					126.16	0.71189	629.00
				...Mean/S=	128.7/6.46	0.641/0.066	640.0/11.0

TABLE 7(cont)

LOW RATE BIAXIAL
DISSECTED MOTOR TENSILE
(AXIAL POSITION)

(INNER)

MSN	X-HD SPEED (IN/MIN)	TEST TEMP. (°F)	TEST DATE	AAT (MO)	MAXIMUM STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
0022788	0.0002	+120	75338	150	44.729	0.29079	219.00
	0.02	+120	76329	148	58.329	0.32989	276.00
					58.209	0.35879	284.00
					58.789	0.37439	285.00
			...Mean/S=		58.4/0.31	0.354/0.0226	281.7/4.9
	0.2	+077	76328	148	100.35	0.53179	440.00
					101.39	0.50609	475.00
					102.89	0.49179	463.00
			...Mean/S=		101.5/1.28	0.510/0.020	459.3/17.8
	2.0	+020	76358	149	345.81	0.36069	391.20
					346.25	0.31189	391.10
					360.88	0.36609	440.80
			...Mean/S=		351.0/8.58	0.346/0.030	407.7/28.67
	2.0	+077	76328	148	127.84	0.60959	664.00
					128.79	0.59149	696.00
					136.07	0.63599	687.00
			...Mean/S=		130.9/4.50	0.612/0.022	682.3/16.5

TABLE 8

HIGH RATE TRIAXIAL TENSILE
TEST PRESSURE = 500 PSI
TEST TEMP = +077 °F
X-HD SPEED = 1750.0(IN/MIN)
(GROUPED)

DISSECTED ONLY
(AXIAL POSITION)

	MSN	TEST DATE	AAT	NO.	MAXIMUM STRESS MEAN	MAXIMUM STRESS S	STRAIN AT RUPTURE MEAN	STRAIN AT RUPTURE S	MODULUS MEAN	MODULUS S
Outer	0022135	76320	161	3	624.2	8.25	0.39766	0.0114	5838.3	517.0
	0022583	76348	155	3	639.5	6.42	0.44732	0.0386	6786.0	114.7
	0022788	76320	148	3	606.4	2.40	0.44986	0.0188	4784.3	154.3
Inner	0022135	76321	161	3	673.0	3.33	0.51846	0.0198	5651.0	856.5
	0022583	76348	155	3	647.6	4.57	0.60186	0.0596	5262.7	299.0
	0022788	76321	148	3	612.5	6.75	0.61629	0.0137	4959.0	322.2

TABLE 9
HIGH RATE TRIAXIAL TENSILE
TEST PRESSURE = 500 PSI
(AXIAL POSITION)
X-HD SPEED = 1750.0(IN/MIN)
TEST TEMP = +077 °F

RAW DATA

	MSN	TEST DATE	ATT (MO)	MAX. STRESS (PSI)	STRAIN AT RUPTURE (IN/MIN)	MODULUS (PSI)
Outer						
	0022135	76320	161	621.68	0.40899	5506.0
				617.50	0.39779	5575.0
				633.42	0.38619	6434.0
	0022583	76348	155	638.38	0.41549	6890.0
				633.72	0.49029	6805.0
				646.42	0.43619	6663.0
	0022788	76320	148	603.93	0.47149	4815.0
				608.72	0.44049	4921.0
				606.63	0.43759	4617.0
Inner	0022135	76321	161	674.75	0.50769	5946.0
				675.14	0.50639	6321.0
				669.19	0.54129	4686.0
	0022583	76348	155	650.38	0.66919	5349.0
				650.10	0.58039	5509.0
				642.33	0.55599	4930.0
	0022788	76321	148	615.09	0.61269	4773.0
				617.65	0.60479	5331.0
				604.89	0.63139	4773.0

TABLE 10
HIGH RATE HYDROSTATIC TENSILE
TEST PRESSURE = 500 PSI
TEST TEMP = +077 °F
X-HD SPEED = 1750.0(IN/MIN)

DISSECTED ONLY
(AXIAL POSITION)

GROUPED

					MAXIMUM STRESS		STRAIN AT RUPTURE		MODULUS	
	MSN	TEST DATE	AAT	NO.	MEAN	S	MEAN	S	MEAN	S
	0022135	76317	161	3	539.6	2.11	0.43689	0.0023	5870.3	212.2
	0022583	75161	137	3	331.5	11.7	0.48959	0.0095	2585.7	183.2
Outer		76337	155	3	518.0	6.12	0.52672	0.0083	5332.3	194.1
	0022788	75161	131	3	331.0	34.5	0.43289	0.0194	2671.7	85.36
		76317	148	3	542.1	2.13	0.41879	0.0024	6628.0	239.0
	0022135	75160	144	6	301.0	37.59	0.48129	0.0691	2529.8	474.2
		76317	161	3	572.1	11.13	0.52772	0.0072	6500.0	144.8
Inner	0022583	75161	137	2	350.9	6.72	0.67129	0.0305	2466.0	152.7
		76337	155	3	521.8	23.8	0.67986	0.0273	4940.7	91.2
	0022788	75161	131	3	335.2	39.0	0.63812	0.1782	2211.0	197.6
		76317	148	3	532.4	4.29	0.65532	0.01179	5846.0	214.1

TABLE 11
HIGH RATE HYDROSTATIC TENSILE
TEST PRESSURE = 500 PSI
(AXIAL POSITION)
X-HD SPEED = 1750.0(IN/MIN)
TEST TEMP = +077 °F

RAW DATA

	MSN	TEST DATE	ATT (MO)	MAX. STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
Outer	0022135	76317	161	542.07	0.43599	5881.0
				538.53	0.43519	6077.0
				538.30	0.43949	5653.0
	0022583	75161	137	328.41	0.47969	2774.0
				321.54	0.49049	2575.0
				344.43	0.49859	2408.0
		76337	155	518.67	0.53599	5134.0
				512.95	0.52019	5522.0
				525.18	0.52399	5341.0
	0022788	75161	131	370.69	0.41769	2732.0
				307.56	0.45469	2574.0
				314.89	0.42629	2709.0
		76317	148	542.25	0.42109	6765.0
				544.07	0.41899	6352.0
				539.83	0.41629	6767.0
Inner	0022135	75160	144	300.50	0.39669	2680.0
				361.58	0.59239	2928.0
				307.36	0.44319	2980.0
				309.66	0.52419	2717.0
				278.14	0.48299	1902.0
		76317	161	561.23	0.52319	6378.0
				571.60	0.52399	6462.0
				583.47	0.53599	6660.0
	0022583	75161	137	346.14	0.69289	2358.0
				355.65	0.64969	2574.0

TABLE 11 (cont)
HIGH RATE HYDROSTATIC TENSILE
TEST PRESSURE = 500 PSI
(AXIAL POSITION)
X-HD SPEED = 1750.0(IN/MIN)
TEST TEMP = +077 °F

RAW DATA

	MSN	TEST DATE	ATT (MO)	MAX. STRESS (PSI)	STRAIN AT RUPTURE (IN/IN)	MODULUS (PSI)
Inner	0022583	76337	155	524.11	0.65199	5042.0
				496.95	0.68099	4915.0
				544.44	0.70659	4865.0
	0022788	75161	131	307.65	0.65839	1992.0
				318.02	0.63109	2376.0
				379.79	0.62489	2265.0
		76317	148	534.76	0.65089	6036.0
				534.95	0.66869	5614.0
				527.42	0.64639	5888.0

TABLE 12

STRESS RELAXATION 0.5% STRAIN

(Outer) (Axial Position Grouped)

MSN	Temp. (°F)	10 Sec. Mean	10 Sec. S	50 Sec. Mean	50 Sec. S	100 Sec. Mean	100 Sec. S	1000 Sec. Mean	1000 Sec. S
0022135	-65	49813	502	46933	473	44833	324	36867	81
	-40	27347	4031	21127	1812	18147	1394	10200	632
	20	2327	421	1520	280	1327	301	860	211
	77	1503	941	547	31	500	40	393	31
	120	527	92	467	92	440	87	393	83
	160	413	42	360	20	333	31	273	31
	180	227	12	200	20	180	20	153	12
0022583	-65	58120	2306	54080	836	51987	341	42527	2916
	-40	26207	2182	19540	1543	16287	1280	8293	771
	77	573	42	440	35	407	31	327	31
	120	447	12	380	0	363	20	240	20
	160	333	12	293	12	273	31	227	23
	180	293	12	247	12	220	20	167	12
0022788	-65	52273	844	48440	498	46993	484	41927	602
	-40	27487	3571	23440	4295	20380	2185	11640	1671
	20	2293	232	1593	95	1347	81	800	72
	77	613	90	480	72	440	72	353	50
	160	353	42	300	35	292	42	240	20
	180	293	31	260	20	240	20	193	12

TABLE 13

STRESS RELAXATION 0.5% STRAIN
Raw Data

(Outer) (Axial Position)

MSN	Test Temp. (°F)	Test Date	AAT (Mo.)	10 Sec (psi)	50 Sec. (psi)	100 Sec. (psi)	1000 Sec. (psi)
0022135	-065	76315	161	49940.0	47100.0	45040.0	36820.0
				49260.0	46400.0	44460.0	36960.0
				50240.0	47300.0	45000.0	36820.0
	-040	76315	161	29900.0	22300.0	19040.0	10660.0
				29440.0	22040.0	18860.0	10460.0
				22700.0	19040.0	16540.0	9480.0
	+020	76315	161	2760.0	1800.0	1640.0	1080.0
				2300.0	1520.0	1300.0	840.0
				1920.0	1240.0	1040.0	660.0
	+077	76313	161	740.0	580.0	540.0	420.0
				660.0	540.0	500.0	400.0
				640.0	520.0	460.0	360.0
	+120	76313	161	580.0	520.0	500.0	460.0
				580.0	520.0	480.0	420.0
				420.0	360.0	340.0	300.0
	+160	76313	161	460.0	380.0	360.0	300.0
				400.0	360.0	340.0	280.0
				380.0	340.0	300.0	240.0
	+180	76313	161	220.0	200.0	180.0	160.0
				240.0	220.0	200.0	160.0
				220.0	180.0	160.0	140.0
0022583	-065	76337	155	59560.0	54360.0	51660.0	39860.0
				55460.0	53140.0	51960.0	45640.0
				59340.0	54740.0	52340.0	42080.5
	-040	76336	155	27100.0	20500.0	16860.0	8580.0

TABLE 13(cont)

STRESS RELAXATION 0.5% STRAIN
Raw Data

(Outer) (Axial Position)

MSN	Test Temp (°F)	Test Date	AAT (Mo.)	10 Sec. (psi)	50 Sec. (psi)	100 Sec. (psi)	1000 Sec. (psi)
0022583	-040	76328	155	27800.0	20360.0	17180.0	8880.0
				23720.0	17760.0	14820.0	7420.0
	+077	76328	155	560.0	420.0	400.0	320.0
				620.0	480.0	440.0	360.0
				540.0	420.0	380.0	300.0
	+120	76334	155	440.0	380.0	340.0	220.0
				460.0	380.0	360.0	260.0
				440.0	380.0	340.0	240.0
	+160	76335	155	320.0	280.0	240.0	200.0
				340.0	300.0	280.0	240.0
				340.0	300.0	300.0	240.0
	+180	76335	155	300.0	240.0	220.0	160.0
				300.0	240.0	200.0	160.0
				280.0	260.0	240.0	180.0
0022788	-065	76315	148	53220.0	48980.0	47340.0	41980.0
				52000.0	48000.0	46440.0	41300.0
				51600.0	48340.0	47200.0	42500.0
	-040	76315	148	31020.0	22520.0	19220.0	10980.0
				23880.0	28120.0	22900.0	13540.0
				27560.0	19680.0	19020.0	10400.0
	+020	76315	148	2260.0	1520.0	1300.0	740.0
				2540.0	1700.0	1440.0	880.0
				2080.0	1560.0	1300.0	780.0

TABLE 13(cont)

STRESS RELAXATION 0.5% STRAIN
Raw Data

(Outer) (Axial Position)

MSN	Test Temp (°F)	Test Date	AAT (Mo.)	10 Sec. (psi)	50 Sec. (psi)	100 Sec. (psi)	1000 Sec. (psi)
0022788	+077	76313	148	700.0	540.0	500.0	400.0
				620.0	500.0	460.0	360.0
				520.0	400.0	360.0	300.0
	+160	76313	148	320.0	280.0	260.0	240.0
				400.0	340.0	340.0	260.0
				340.0	280.0	280.0	220.0
	+180	76313	148	320.0	280.0	260.0	200.0
				300.0	260.0	240.0	200.0
				260.0	240.0	220.0	180.0

TABLE 14

STRESS RELAXATION 0.5% STRAIN

(Inner) (Axial Position Grouped)

MSN	Temp. (°F)	10 Sec Mean	10 Sec S	50 Sec. Mean	50 Sec. S	100 Sec. Mean	100 Sec. S	1000 Sec. Mean	1000 Sec. S
0022135	-65	45867	12195	42800	10954	40613	10216	31840	6988
	-40	30493	2010	22580	473	16640	1648	9307	1145
	20	2327	64	1580	35	1367	31	860	20
	77	693	61	540	53	487	46	373	42
	120	560	53	467	42	440	40	386	61
	160	413	42	333	42	300	53	247	46
	180	440	0	380	20	360	0	327	12
0022583	-65	49100	9021	44560	7763	42207	7084	32200	4749
	-40	23713	3402	16940	3170	14160	2719	7333	1172
	77	380	0	273	12	247	12	173	12
	120	266	12	220	20	200	35	173	23
	160	227	12	193	12	180	0	140	0
	180	227	12	193	12	180	0	140	0
0022788	-65	48913	8495	46447	7616	45687	7269	42167	5990
	-40	28353	5471	21253	2794	18053	2327	10107	976
	20	1947	64	1233	58	1033	58	540	0
	77	440	35	327	23	293	31	213	31
	120	353	118	297	100	277	92	240	104
	160	233	12	193	12	187	12	147	12
	180	213	12	187	12	167	12	133	12

TABLE 15

STRESS RELAXATION 0.5% STRAIN
Raw Data

(Inner) (Axial Position)

MSN	Test Temp. (°F)	Test Date	AAT (Mo.)	10 Sec. (psi)	50 Sec. (psi)	100 Sec. (psi)	1000 Sec. (psi)
0022135	-065	76315	161	59940.0	55440.0	52400.0	39900.0
				39240.0	36880.0	35140.0	28140.0
				38420.0	36080.0	34300.0	27480.0
	-040	76315	161	32520.0	23080.0	18480.0	10580.0
				30460.0	22520.0	16140.0	8980.0
				28500.0	22140.0	15300.0	8360.0
	+020	76315	161	2280.0	1560.0	1360.0	860.0
				2300.0	1560.0	1340.0	840.0
				2400.0	1620.0	1400.0	880.0
	+077	76313	161	680.0	520.0	460.0	340.0
				760.0	600.0	540.0	420.0
				640.0	500.0	460.0	360.0
	+120	76313	161	600.0	500.0	480.0	440.0
				580.0	480.0	440.0	400.0
				500.0	420.0	400.0	320.0
	+160	76313	161	460.0	380.0	360.0	300.0
				400.0	300.0	260.0	220.0
				380.0	320.0	280.0	220.0
	+180	76313	161	440.0	400.0	360.0	340.0
				440.0	360.0	360.0	320.0
				440.0	380.0	360.0	320.0

TABLE 15 (cont)

STRESS RELAXATION 0.5% STRAIN

(Inner) (Axial Position)

MSN	Test Temp. (°F)	Test Date	AAT (Mo.)	10 Sec. (psi)	50 Sec. (psi)	100 Sec. (psi)	1000 Sec. (psi)
0022583	-065	76337	155	58960.0	52920.0	49740.0	36460.0
				47080.0	43180.0	41200.0	33060.0
				41260.0	37580.0	35680.0	27080.0
	-040	76336	155	27640.0	20600.0	17300.0	8680.0
				21660.0	15100.0	12580.0	6540.0
				21840.0	15120.0	12600.0	6780.0
	+077	76328	155	380.0	260.0	240.0	180.0
				380.0	280.0	240.0	160.0
				380.0	280.0	260.0	180.0
	+120	76334	155	260.0	220.0	180.0	160.0
				260.0	200.0	180.0	160.0
				280.0	240.0	240.0	200.0
	+160	76335	155	220.0	200.0	180.0	140.0
				220.0	180.0	180.0	140.0
				240.0	200.0	180.0	140.0
	+180	76335	155	220.0	180.0	180.0	140.0
				220.0	200.0	180.0	140.0
				240.0	200.0	180.0	140.0
0022788	-065	76315	148	44200.0	42180.0	41580.0	38900.0
				43820.0	41920.0	41400.0	38520.0
				58720.0	55240.0	54080.0	49080.0
	-040	76315	148	29560.0	21940.0	18740.0	10660.0
				22380.0	18180.0	15460.0	8980.0
				33120.0	23640.0	19960.0	10680.0
	+020	76315	148	2020.0	1300.0	1100.0	540.0
				1900.0	1200.0	1000.0	540.0
				1920.0	1200.0	1000.0	540.0

TABLE 15(cont)

STRESS RELAXATION 0.5% STRAIN

(Inner) (Axial Position)

MSN	Test Temp. (°F)	Test Date	AAT (Mo.)	10 Sec. (psi)	50 Sec. (psi)	100 Sec. (psi)	1000 Sec. (psi)
0022788	+077	76313	148	400.0	300.0	260.0	180.0
				460.0	340.0	300.0	220.0
				460.0	340.0	320.0	240.0
	+120	76313	148	260.0	220.0	200.0	140.0
				260.0	220.0	200.0	180.0
				220.0	180.0	180.0	120.0
	+120	76313	148	440.0	380.0	340.0	320.0
				460.0	380.0	360.0	340.0
				480.0	400.0	380.0	340.0
	+160	76313	148	240.0	200.0	200.0	140.0
				240.0	200.0	180.0	140.0
				220.0	180.0	180.0	160.0
	+180	76313	148	220.0	180.0	160.0	120.0
				200.0	180.0	160.0	140.0
				220.0	200.0	180.0	140.0

TABLE 16

BURN RATE
INITIAL PRESSURE = 350 PSI
(NON-ORIENTED)

	MSN	TEST DATE	AAT (MO)	BURN RATE (IN/SEC)
(OUTER)	0022135	76315	161	0.267
				0.263
				0.261
			...Mean/S=	0.264/0.003
		76352	162	0.275
				0.285
				0.274
				0.295
				0.397
				0.352
			...Mean/S=	0.313/0.050
	0022583	76323	154	0.232
				0.231
				0.230
			...Mean/S=	0.231/0.001
		76352	155	0.255
				0.256
				0.259
				0.250
				0.233
				0.235
			...Mean/S=	0.248/0.011
	0022788	76315	148	0.232
				0.230
				0.225
			...Mean/S=	0.229/0.004
		76352	149	0.250
				0.252
				0.247
				0.250
				0.258
				0.248
			...Mean/S=	0.251/0.004

TABLE 17

BURN RATE
INITIAL PRESSURE = 500 PSI
(NON-ORIENTED)

	MSN	TEST DATE	AAT (MO)	BURN RATE (IN/SEC)
INNER	0022135	76315	161	0.279
				0.257
				0.273
			...Mean/S=	0.270/0.011
		76352	162	0.408
				0.407
				0.402
				0.404
				0.393
				0.381
			...Mean/S=	0.399/0.010
	0022583	76323	154	0.382
				0.379
				0.375
			...Mean/S=	0.379/0.004
		76352	155	0.429
				0.423
				0.422
				0.421
				0.413
				0.423
			...Mean/S=	0.422/0.005
	0022788	76315	148	0.365
				0.379
				0.367
			...Mean/S=	0.370/0.008
		76352	149	0.396
				0.400
				0.401
				0.390
				0.385
				0.408
			...Mean/S=	0.397/0.008

TABLE 18

THERMAL COEFFICIENT OF LINEAR EXPANSION
(NON-ORIENTED)
Temp -120° to 0°C

	MSN	TEST DATE	AAT (MO)	TCLE/ BELOW (IN/IN/°C	GLASS POINT (°C)	TCLE/ ABOVE (IN/IN/°C)
Outer	0022135	76314	161	0.0000561	-57.0	0.0001065
				0.0000580	-59.0	0.0001067
				0.0000607	-55.0	0.0001023
		...Mean/S=		0.0000583/0.000002	-57.0/2.0	0.0001052/0.000002
	0022583	76322	154	0.0000574	-50.0	0.0000874
				0.0000597	-61.0	0.0000923
				0.0000610	-59.0	0.0000927
		...Mean/S=		0.0000594/0.000002	-56.7/5.9	0.0000908/0.000003
	0022788	76314	148	0.0000623	-61.0	0.0001023
				0.0000571	-60.0	0.0000950
				0.0000529	-61.0	0.0000941
		...Mean/S=		0.0000574/0.000005	-60.7/0.6	0.0000971/0.000006
Inner	0022135	76313	161	0.0000619	-59.0	0.0000979
				0.0000522	-59.0	0.0001013
				0.0000619	-61.0	0.0000998
		...Mean/S=		0.0000606/0.000002	-59.7/1.2	0.0000997/0.000002
	0022583	76322	154	0.0000624	-67.0	0.0000894
				0.0000581	-63.0	0.0000830
				0.0000493	-42.0	0.0000916
		...Mean/S=		0.0000566/0.000007	-57.3/13.4	0.0000880/0.000004
	0022788	76314	148	0.0000585	-63.0	0.0000985
				0.0000604	-65.0	0.0001023
				0.0000581	-60.0	0.0000981
		...Mean/S=		0.0000590/0.000001	-62.7/2.5	0.0000996/0.000002

TABLE 19

TCLE, EQUATIONS OF CURVES BELOW Tg
Temp -120° to 0°C

Motor Nr	Propellant	TCLE$\times 10^5$	Equation of Curve	L, inches
0022135	Inner	6.20	$y = -1.302A + 1.563B + 0.02833x + 4.000$	0.198
		5.23	$y = -1.562A + 0.3170B + 0.02338x + 4.350$	0.198
		6.20	$y = -1.302A + 0.9370B + 0.02758x + 6.450$	0.198
	Outer	5.62	$y = -0.7817A + 1.562B + 0.02550x + 4.320$	0.200
		5.81	$y = 3.438B + 0.02738x + 5.220$	0.200
		6.08	$y = -2.083A + 0.001B + 0.02733x + 6.360$	0.200
0022583	Inner	6.25	$y = -0.7812A + 1.875B + 0.02762x + 3.820$	0.194
		5.82	$y = -1.302A + 1.250B + 0.02596x + 4.740$	0.194
		4.94	$y = -1.042A + 0.9340B + 0.02179x + 5.650$	0.194
	Outer	5.75	$y = -0.2608A + 2.812B + 0.02640x + 3.050$	0.197
		5.98	$y = -0.5208A + 2.505B + 0.02733x + 4.380$	0.197
		6.11	$y = +1.042A + 5.313B + 0.02896x + 6.000$	0.197
0022788	Inner	5.86	$y = -0.5208A + 2.505B + 0.02733x + 3.930$	0.201
		6.05	$y = -0.5212A + 2.187B + 0.02771x + 5.270$	0.201
		5.82	$y = -1.042A + 1.249B + 0.02642x + 7.010$	0.201
	Outer	6.24	$y = -0.7808A + 2.188B + 0.02850x + 4.270$	0.198
		5.72	$y = -0.2608A + 2.812B + 0.02642x + 5.190$	0.198
		5.30	$y = -0.7808A + 1.251B + 0.02363x + 6.320$	0.198

NOTE: $A = 10^{-7}\, x^3$
$B = 10^{-5}\, x^2$

TABLE 19 (cont)

TCLE, EQUATIONS OF CURVES ABOVE Tg
Temp -120° to 0°C

Motor Nr	Propellant	TCLE$\times 10^5$	Equation of Curve	L, inches
0022135	Inner	9.80	$y = -2.083A + 1.876B + 0.04408x + 4.900$	0.198
		10.14	$y = -1.042A + 4.374B + 0.04692x + 5.620$	0.198
		9.99	$y = -1.302A + 3.750B + 0.04596x + 7.450$	0.198
	Outer	10.66	$y = -0.2604A + 5.625B + 0.04979x + 5.570$	0.200
		10.68	$y = -2.083A + 2.501B + 0.04833x + 6.440$	0.200
		10.24	$y = -1.302A + 3.438B + 0.04709x + 7.360$	0.200
0022583	Inner	8.95	$y = -1.563A + 2.187B + 0.03963x + 4.580$	0.194
		8.31	$y = -0.7813A + 3.125B + 0.03713x + 5.390$	0.194
		9.17	$y = -1.302A + 2.813B + 0.04084x + 6.430$	0.194
	Outer	8.75	$y = -0.7813A + 3.125B + 0.03938x + 3.700$	0.197
		9.24	$y = -1.823A + 1.875B + 0.04129x + 5.220$	0.197
		9.28	$y = -2.083A + 1.251B + 0.04108x + 6.800$	0.197
0022788	Inner	9.86	$y = -1.042A + 3.124B + 0.04492x + 5.010$	0.201
		10.24	$y = -0.2604A + 5.313B + 0.04792x + 6.450$	0.201
		9.82	$y = -1.563A + 2.499B + 0.04475x + 8.060$	0.201
	Outer	10.24	$y = -1.302A + 3.750B + 0.04696x + 5.310$	0.198
		9.51	$y = -0.2604A + 5.000B + 0.04404x + 6.170$	0.198
		9.42	$y = -1.302A + 3.125B + 0.04296x + 7.400$	0.198

NOTE: $A = 10^{-7}\ x^3$
$B = 10^{-5}\ x^2$

TABLE 20

HARDNESS
DISSECTED MOTORS
(NON-ORIENTED)

(OUTER)

	MSN	TEST DATE	AAT (MO)	SHORE-A 10 SEC.
	0022135	76314	161	67.0
				66.0
				68.0
				67.0
				66.0
				66.0
				68.0
				66.0
			...Mean/S=	66.8/0.89
	0022583	76317	154	68.0
				67.0
				67.0
				66.0
				65.0
				65.0
				64.0
				64.0
			...Mean/S=	65.8/1.49
	0022788	76303	147	64.0
				66.0
				66.0
				64.0
				64.0
				66.0
				65.0
				67.0
			...Mean/S=	65.3/1.16
INNER	0022135	76301	161	70.0
				69.0
				69.0
				69.0
				69.0
				68.0
				69.0
				69.0
			...Mean/S=	69.0/0.53
	0022583	76317	154	61.0
				60.0
				61.0
				61.0
				61.0
				60.0

TABLE 20(cont)

HARDNESS
DISSECTED MOTORS
(NON-ORIENTED)

	MSN	TEST DATE	AAT (MO)	SHORE-A 10 SEC
INNER	0022583	76317	154	62.0
				61.0
			...Mean/S=	60.9/0.64
	0022788	76303	147	61.0
				62.0
				62.0
				62.0
				63.0
				62.0
				61.0
				62.0
			...Mean/S=	61.9/0.64

TABLE 21

SOL GEL
DISSECTED ONLY
TEST TEMP. = 77°F
(NON-ORIENTATION)

	MSN	TEST DATE	ATT (MO)	GEL SWELL RATIO	WEIGHT SWELL RATIO	MASS DENSITY (GM/Cc)	DENSITY (MILLI-EQUIV.-LINK Cc)	%EXTRACT-ABLE
Outer	0022135	76323	161	9.4500	3.6465	1.7586	0.0430	6.4539
				9.5470	3.6227	1.7586	0.0484	6.5799
				9.3402	3.3791	1.7590	0.0430	6.8539
	...Mean/S=			9.4457/0.103	3.5494/0.148	1.7587/0.0002	0.0448/0.003	6.6292/0.205
	0022583	76323	154	7.5959	3.3695	1.7577	0.0534	5.1109
				7.3977	3.3455	1.7565	0.0815	4.9209
				7.4840	3.3348	1.7569	0.0860	5.0549
	...Mean/S=			7.4925/0.100	3.3500/0.018	1.7570/0.001	0.0736/0.018	5.0289/0.976
	0022788	76323	148	8.3429	3.2655	1.7593	0.0516	6.1679
				8.5235	3.2662	1.7586	0.0419	6.3499
				8.6605	3.2312	1.7592	0.0516	6.5459
	...Mean/S=			8.5090/0.159	3.2543/0.020	1.7590/0.0004	0.0484/0.006	6.3546/0.189
	0022135	76323	161	6.9284	4.0797	1.7638	0.0455	2.3449
				6.9785	4.1385	1.7637	0.0516	2.2859
				6.2024	3.6215	1.7629	0.0553	2.1969
	...Mean/S=			6.7031/0.434	3.9466/0.283	1.7635/0.0005	0.0508/0.005	2.2759/0.075
Inner	0022583	76323	154	7.8956	3.1282	1.7632	0.0860	5.9659
				7.7965	3.1313	1.7633	0.1032	5.8499
				8.0190	3.1359	1.7645	0.0968	6.0719
	...Mean/S=			7.9037/0.111	3.1318/0.004	1.7637/0.0007	0.0953/0.009	5.9626/0.111
	0022788	76323	148	6.7941	3.0533	1.7645	0.0574	4.7500
				7.3653	3.0540	1.7659	0.0553	5.5029
				7.4222	3.0344	1.7655	0.0516	5.6209
	...Mean/S=			7.1939/0.347	3.047/0.011	1.7653/0.0007	0.0548/0.003	5.2913/0.472

TABLE 22

TEAR ENERGY
(AXIAL-ORIENTATION)
Raw Data

OUTER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)	COHESIVE ENERGY (IN-LB/IN^2)
0022135	0.01	76345	162	+40	1.6246
		76345			1.5769
		76345			1.3438
		76352			0.9410
		76352			1.8948
				...Mean/S=	1.48/0.358
		76344	162	+77	0.9857
					0.5262
					0.3820
				...Mean/S=	0.63/0.167
		76362	163	+120	0.5078
		76362	163	+120	0.7433
				...Mean/S=	0.63/0.167
		76363	163	+160	0.4388
					0.3871
					0.5636
				...Mean/S=	0.46/0.091
	0.1	76352	162	+40	2.0499
					1.5418
					1.9868
				...Mean/S=	1.86/0.277
0022135	0.1	76344	162	+77	0.5167
					0.7598
					0.3210
				...Mean/S=	0.53/0.220
		76362	163	+120	1.6012
		76362	163	+120	0.9877
				...Mean/S=	1.29/0.434
		76363	163	+160	0.5864
				+160	0.8125
				+160	0.7791
				...Mean/S=	0.73/0.122
	1.0	76344	162	+77	0.9405
					0.4343
					1.3167
				...Mean/S=	0.90/0.443

TABLE 22 (cont)

TEAR ENERGY
(AXIAL-ORIENTATION)

OUTER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)	COHESIVE ENERGY (IN-LB/IN^2)
		76362	163	+120	2.3145
					1.8062
					1.7060
				...Mean/S=	1.94/0.326
		76363	163	+160	1.1044
		76363	163	+160	0.4128
		76363	163	+160	0.6991
				...Mean/S=	0.74/0.348
0022583	0.01	76352	155	+40	1.0957
					0.9472
					0.9084
				...Mean/S=	0.98/0.099
		76344	155	+77	0.2233
					0.2663
					0.4147
					0.3409
				...Mean/S=	0.31/0.084
		76355	156	+120	0.1365
					0.4855
					0.4645
				...Mean/S=	0.36/0.196
		76363	156	+160	0.1927
					0.1391
					0.1081
				...Mean/S=	0.15/0.043
0022583	0.1	76352	155	+40	2.0573
					1.6119
					1.7241
				...Mean/S=	1.80/0.232
		76344	155	+77	0.2845
					0.1962
					0.2931
				...Mean/S=	0.26/0.054

TABLE 22 (cont)

TEAR ENERGY
(AXIAL-ORIENTATION)

OUTER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)		COHESIVE ENERGY (IN-LB/IN^2)
		76355	156	+120		0.4155
						0.6390
						0.6550
				...Mean/S=	0.57/0.134	
		76363	156	+160		0.2795
						1.0628
						0.4138
				...Mean/S=	0.59/0.419	
	1.0	76352	155	+40		2.5647
						1.7864
						1.6468
				...Mean/S=	2.00/0.495	
0022583	1.0	76344	155	+77		0.7299
						0.5282
						1.3240
				...Mean/S=	0.86/0.414	
		76355	156	+120		0.6971
						0.5865
						0.8953
				...Mean/S=	0.73/0.156	
		76363	156	+160		0.9555
						0.4636
						0.7895
				...Mean/S=	0.74/0.250	
0022788	0.01	77014	150	+40		1.8701
						1.2377
						1.6597
				...Mean/S=	1.59/0.322	
		77010	150	+077		0.9876
						1.2311
						0.7156
				...Mean/S=	0.98/0.258	
0022788	0.01	77011	150	+160		0.6406
						0.8770
						0.8002
				...Mean/S=	0.77/0.121	

TABLE 22 (cont)

TEAR ENERGY
(AXIAL-ORIENTATION)

OUTER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)	COHESIVE ENERGY ($IN-LB/IN^2$)
0022788	0.1	77014	150	+40	3.1263
					2.5327
					2.8296
				...Mean/S=	2.83/0.297
		77010	150	+77	2.0164
					1.6851
					2.0226
				...Mean/S=	1.91/0.193
		77011	150	+160	1.3968
					1.4434
					1.1776
				...Mean/S=	1.34/0.142
	1.0	77014	150	+40	4.7295
					3.4181
				...Mean/S=	4.07/0.927
0022788	1.0	77010	150	+77	2.6913
					3.0477
					3.0212
				...Mean/S=	2.92/0.199
		77011	150	+160	1.8708
					1.9518
					2.3770
				...Mean/S=	2.07/0.272

TABLE 23

TEAR ENERGY
(AXIAL-ORIENTATION)
Raw Data

INNER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)	COHESIVE ENERGY (IN-LB/IN^2)
0022135	0.01	77032	164	+40	0.7416
					1.1831
				...Mean/S=	0.962/0.312
	0.01	77032	164	+77	0.7720
					0.8754
					0.7605
				...Mean/S=	0.803/0.063
	0.01	77014	163	+160	0.8570
					0.8795
					0.9886
				...Mean/S=	0.908/0.070
	0.1	77032	164	+40	1.8331
					1.3588
					1.4882
				...Mean/S=	1.560/0.245
	0.1	77032	164	+77	0.3400
					0.7172
					1.0519
				...Mean/S=	0.703/0.356
	0.1	77014	163	+160	1.0215
					1.3848
					1.2447
				...Mean/S=	1.217/0.183
	1.0	77032	164	+40	3.6486
					2.6343
					3.3490
				...Mean/S=	3.211/0.521
	1.0	77032	164	+77	2.1075
					1.0558
					2.0540
				...Mean/S=	1.739/0.592
	1.0	77014	163	+160	1.6158
					1.8786
					2.0540
				...Mean/S=	1.849/0.221

TABLE 23 (cont)

TEAR ENERGY
(AXIAL-ORIENTATION)

INNER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)	COHESIVE ENERGY ($IN-LB/IN^2$)
0022583	0.01	76356	156	+40	1.7770
					0.9998
				...Mean/S=	1.389/0.550
	0.01	76344	155	+77	0.4227
					0.6524
					0.3484
				...Mean/S=	0.474/0.158
	0.01	76358	156	+120	0.1724
					0.0919
					0.2528
				...Mean/S=	0.172/0.080
	0.01	76363	156	+160	0.4022
					0.5378
					0.4286
				...Mean/S=	0.456/0.072
	0.1	76356	156	+40	2.6298
					2.0101
				...Mean/S=	2.320.0.438
	0.1	76344	155	+77	1.6930
					1.1085
					0.7729
				...Mean/S=	1.191/0.466
	0.1	76362	156	+120	0.7902
					0.8599
				...Mean/S=	0.825/0.049
0022583	0.1	76363	156	+160	0.5988
					0.7856
					0.6450
				...Mean/S=	0.676/0.097
	1.0	76356	156	+40	5.2173
					5.4921
					4.4206
				...Mean/S=	5.043/0.557
	1.0	76344	155	+77	0.9786
					2.0451
					1.0880
				...Mean/S=	1.371/0.587

TABLE 23 (cont)

TEAR ENERGY
(AXIAL-ORIENTATION)

INNER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)	COHESIVE ENERGY (IN-LB/IN^2)
0022583	1.0	76362	156	+120	1.3521
					1.6327
					0.9973
				...Mean/S=	1.327/0.318
	1.0	76363	156	+160	1.0648
					1.0141
					1.1207
				...Mean/S=	1.067/0.053
0022788	0.01	150	77014	+40	1.3198
					1.3639
					1.1585
				...Mean/S=	1.281/0.108
	0.01	150	77010	+77	0.6355
					0.5675
					0.4323
				...Mean/S=	0.545/0.103
	0.01	150	77011	+160	0.7661
					0.9130
					1.2401
				...Mean/S=	0.973/0.243
	0.1	150	77014	+40	1.9781
					2.1353
					2.6246
				...Mean/S=	2.246/0.337
	0.1	150	77010	+77	2.6532
					1.6789
				...Mean/S=	2.166/0.689
0022788	0.1	150	77011	+160	1.3356
					1.7260
					1.5701
				...Mean/S=	1.544/0.197
	1.0	150	77014	+40	2.6943
					2.4843
					2.8067
				...Mean/S=	2.662/0.164
	1.0	150	77101	+77	3.6668
					2.8101

TABLE 23 (cont)

TEAR ENERGY
(AXIAL-ORIENTATION)

INNER

MSN	X-HD SPEED (IN/MIN)	TEST DATE	AAT (MO)	TEST TEMP. (°F)	COHESIVE ENERGY ($IN-LB/IN^2$)
					2.4089
				...Mean/S=	2.962.0.643
	1.0	77011	150	+160	1.2395
					1.1966
					1.1085
				...Mean/S=	1.182/0.067

TABLE 24

BULK MODULUS, Motor 002278 Outer

	SPECIMEN NO 1		SPECIMEN NO 2		SPECIMEN NO 3			
Applied Pressure psi	% (change in volume)	K (bulk Modulus psi) $x10^{-5}$	% (change in volume)	K (bulk Modulus, psi) $x10^{-5}$	% (change in volume)	K (bulk Modulus psi) $x10^{-5}$	% Mean/S	K Mean x 10^{-5} S x 10^{-5}
200	0.0780	2.56	0.0720	2.78	0.0420	4.76	0.0640/0.0193	3.37/1.21
400	0.102	3.92	0.102	3.92	0.540	7.41	0.248/.253	5.08/2.01
600	0.120	5.00	0.132	4.55	0.0780	7.69	0.110/0.0284	5.75/1.70
800	0.138	5.80	0.162	4.94	0.102	7.84	0.134/0.0302	6.19/1.49
1000	0.156	6.41	0.192	5.21	0.132	7.58	0.160/0.0302	6.40/1.18
1200	0.174	6.90	0.216	5.55	0.156	7.69	0.182/0.0308	6.71/1.08
1400	0.186	7.53	0.240	5.83	0.180	7.78	0.202/0.0330	7.05/1.06
1600	0.204	7.84	0.264	6.06	0.204	7.84	0.224/0.0346	7.25/1.03
1800	0.222	8.11	0.294	6.12	0.222	8.11	0.246/0.0416	7.45/1.15
2000	0.234	8.55	0.312	6.41	0.246	8.13	0.264/0.0420	7.70/1.13

BULK MODULUS, Motor 002278 Inner

200	0.0420	4.76	0.0600	3.33	0.0180	1.11	0.0400/0.0211	2.07/1.84
400	0.0660	6.06	0.0840	4.76	0.0420	9.52	0.0640/0.0211	6.78/2.46
600	0.0960	6.25	0.102	5.88	0.0600	10.0	0.0860/0.0227	7.38/2.30
800	0.120	6.67	0.126	6.35	0.0780	10.3	0.108/0.0262	7.77/2.19
1000	0.144	6.95	0.144	6.94	0.102	9.80	0.130/0.0242	7.90/1.65
1200	0.168	7.14	0.168	7.14	0.126	9.52	0.154/0.0242	7.93/1.37
1400	0.192	7.29	0.186	7.53	0.144	9.72	0.174/0.0262	8.18/1.34
1600	0.222	7.21	0.204	7.84	0.162	9.88	0.196/0,0308	8.31/1.40
1800	0.246	7.32	0.228	7.90	0.186	9.68	0.220/0.0308	8.30/1.23
2000	0.270	7.41	0.246	8.13	0.210	9.52	0.242/0.0302	8.35/1.07

TABLE 25

BULK MODULUS, Motor 0022135 Inner

	SPECIMEN NO 1		SPECIMEN NO 2		SPECIMEN NO 3			
Applied Pressure psi	% (change in volume)	K (bulk Modulus psi) $x10^{-5}$	% (change in volume)	K (bulk Modulus, psi) $x10^{-5}$	% (change in volume)	K (bulk Modulus psi) $x10^{-5}$	% Mean/S	K Mean $x10^{-5}$/ S x 10^{-5}
200	0.0540	3.70	0.0480	4.17	0.0720	2.78	0.0580/0.0125	3.55/0.707
400	0.0780	5.13	0.0780	5.13	0.102	3.92	0.0860/0.0138	4.73/0.0698
600	0.102	5.88	0.0960	6.25	0.126	4.76	0.108/0.0159	5.63/0.776
800	0.120	6.67	0.126	6.35	0.150	5.33	0.132/0.0159	6.12/0.700
1000	0.144	6.95	0.150	6.67	0.174	5.75	0.156/0.0159	6.46/0.628
1200	0.168	7.14	0.174	6.90	0.198	6.06	0.180/0.0159	6.70/0.567
1400	0.186	7.53	0.198	7.07	0.222	6.31	0.202/0.0183	6.97/0.616
1600	0.210	7.62	0.216	7.41	0.240	6.67	0.222/0.0159	7.23/0.499
1800	0.228	7.90	0.240	7.50	0.264	6.82	0.244/0.0183	7.41/0.546
2000	0.252	7.94	0.264	7.58	0.282	7.09	0.266/0.0151	7.54/0.427

TABLE 26

INSULATION MATERIALS

TENSILE (MAX/STRESS)
Test Temp = + 77°F
X-HD Speed = 20.0 in/min

Insulation Materials	Motor S/N	Test Date	Age at Test (mo)	Maximum Stress (PSI)
Garlock/7765 Internal Insul.	0022135	77083	165	3169
				2292
				2797
				2479
			Mean/S=	2684.3/384.6
	0022583	77083	158	2657
				3275
				3208
				3432
			Mean/S=	3143.0/337.3
	0022788	77083	152	2961
				2822
				2938
				3093
			Mean/S=	2953.5/111.1

TABLE 27

INSULATION MATERIALS

TENSILE (MAX/STRESS)
Test Temp = + 77°F
X-HD Speed = 20.0(in/min)

Insulation Materials	Motor S/N	Test Date	Age at Test (mo)	Maximum Stress (PSI)
V-44 Internal Insulation	0022135	77081	165	1464
				1499
				1475
				1450
				1452
				1402
				1374
			Mean/S=	1445.1/43.1
	0022583	77081	158	1332
				1398
				1489
				1406
				1392
				1407
				1452
				1381
			Mean/S=	1407.1/46.8
	0022788	77081	152	1726
				1742
				1777
				1787
				1698
				1675
				1711
				1698
				1717
				1757
				1770
			Mean/S =	1732.5/36.7

TABLE 28

INSULATION MATERIALS

TENSILE (MAX/STRESS)
Test Temp = + 77°F
X-HD Speed = 20 (in/min)

Insulation Materials	Motor S/N	Test Date	Age at Test (mo)	Maximum Stress (PSI)
DC-6510 External Insulation	0022135	77080	165	526
				294
				332
				331
				266
				281
				288
				235
			Mean/S=	319.1/89.5
	0022583		158	863
				728
				862
				921
				948
				734
				988
				845
				903
			Mean/S=	865.8/88.7
	0022788		152	596
				796
				526
				1004
				1056
				938
				691
				643
			Mean/S=	781.3/198.8

TABLE 29

INSULATION MATERIALS

TENSILE (MAX/STRESS)
Test Temp = + 77°F
X-HD Speed = 0.05(in/min)

Insulation Materials	Motor S/N	Test Date	Age at Test (mo)	Maximum Stress (PSI)
AVCOAT II Bonded to Titanium	0022135	77069	165	1538
				1454
				1630
				1467
				1642
				945
				1632
				1449
				802
				1403
				448
				1747
		Mean/S=		1346.4/399.0
	0022788	77069	152	959
				1042
				912
				1044
				1136
				899
				820
				985
				983
				812
				988
				845
			Mean/S=	952.1/98.5

TABLE 30

INSULATION MATERIALS

PEEL

Test Temperature= 77°F (1" x 12")   Crosshead Speed = 12.0 in/min

Insulation Material	Motor S/N	Test Date	Age at Test (mo)	Average Peel at 180° (Lbs/in-width)
Garlock/7765 Bonded to Titanium	0022135	77059	165	78.9
				75.0
				66.0
				76.0
				55.1
				78.0
			...Mean/S=	71.5/9.3
	0022583	77059	158	66.2
				57.0
				55.2
				61.5
				65.0
				68.1
				57.2
				62.0
			...Mean/S=	61.5/4.7
	0022788	77059	151	56.8
				49.0
				45.8
				49.5
				56.3
				85.1
				56.0
				46.0
				47.1
			...Mean/S=	54.6/12.3
DC-6510 Bonded to Titanium	0022583	77059	158	35.5
				14.4
				29.1
				35.2
				5.8
				36.7
				6.3
				18.0
				19.1
			...Mean/S=	22.2/12.3

TABLE 30(cont)

INSULATION MATERIALS

PEEL

Test Temperature= 77°F (1" x 12")   Crosshead Speed = 12.0 in/min

Insulation Material	Motor S/N	Test Date	Age at Test (mo)	Average Peel at 180° (Lbs/in-width)
DC-6510 Bonded to Titanium	0022788	77060	151	13.6
				19.6
				24.8
				17.0
				17.6
				19.0
				18.2
				11.7
			...Mean/S=	17.7/4.0

TABLE 31

INSULATION MATERIALS

LAP SHEAR

Test Temperature = 77°F   Crosshead Speed = 0.05 in/min

Insulation Material	Motor S/N	Test Date	Age at Test (mo)	Lap Shear Strength (PSI)
Garlock/7765 Bonded to Titanium	0022135	77104	166	614
				658
				552
				543
				554
				578
				552
				592
			...Mean/S=	580.4/39.6
	0022583	77104	159	450
				622
				615
				451
				490
				446
				421
				522
			..Mean/S=	502.1/78.1
	0022788	77104	153	457
				471
				512
				372
				503
				489
				377
				476
			...Mean/S=	457.1/53.9
DC-6510 Bonded to Titanium	0022583	77108	159	120
				103
				90
				87
				99
				92
				115
				78
				70
			...Mean/S=	94.9/16.3
	0022788	77108	153	66
				35
				77

TABLE 31 (cont)

INSULATION MATERIALS

LAP SHEAR

Test Temperature = 77°F   Crosshead Speed = 0.05 in/min

Insulation Material	Motor S/N	Test Date	Age at Test (mo)	Lap Shear Strength (PSI)
DC-6510 Bonded to Titanium	0022788	77108	153	58
				58
				16
				45
				54
			...Mean/S=	51.1/19.0

TABLE 32

INSULATION MATERIALS

LAP SHEAR

AT 'Y' JOINT

Test Temperature = 77°F

Crosshead Speed = 0.05 in/min

Insulation Material	Motor S/N	Test Date	Age at Test (mo)	Lap Shear Strength (PSI)
Garlock/7765 at 'Y' Joint	0022583	77160	158	153
				123
				122
				103
				077
				113
				139
				120
			...Mean/S=	118.8/22.8

TABLE 33

INSULATION MATERIALS

TENSILE (MAX/STRESS)
Test Temp = 120°F

	MSN	X-HD Speed (in/min)	Test Date	AAT (mo)	X-Sec Area (In^2)	Maximum Stress (PSI)
Case/Liner/ Propellant	0022135	0.0002	76272	160	1.0000	25.46
						24.98
						23.04
					Mean/S=	24.5/1.28
			76286	160	2.4053	19.25
		0.002	76271	160	1.0000	28.11
						24.69
						31.97
					Mean/S=	28.3/3.64
			76272	160	2.4053	20.45
						22.90
						23.07
					Mean/S=	22.1/1.47
	0022788	0.0002	76274	147	1.0000	17.40
						17.50
					Mean/S=	17.5/0.07
		0.002	76268	146	1.0000	26.01
						23.81
						15.54
					Mean/S=	21.8/5.52
		0.0002	76279	147	2.4053	14.14
						19.25
						19.53
					Mean/S=	17.6/3.03
		0.002	76273	147	2.4053	18.50
						17.67
						17.38
					Mean/S=	17.9/0.58

TABLE 34

Analysis of Covariance
Motor-to-Motor, Comparing 22135, 22583 and 22788 at the 5% Significance Level,
Test Temp. = 77°F, Dissected Only

	Test	Tensile Test	Regression Line Comparisons: Slopes	Regression Line Comparisons: Elevations	Regression Line Comparisons: Effects Due To Age
OUTER					
	Very Low Rate	SM	S	S	N.S
	Tensile	ER	N.S.	S	S
	(CHS = 0.0002)	E	N.S.	S	N.S
INNER					
	Very Low Rate	SM	S	S	N.S
	Tensile	ER	N.S	S.	N.S
	(CHS=0.0002)	E	S	S.	N.S
OUTER					
	Low Rate	SM	S	S	S
	Tensile	ER	N.S.	S	N.S
	(CHS=0.2)	E	S	S	S
INNER					
	Low Rate	SM	S	S	S
	Tensile	ER	S	S	S
	(CHS=0.2)	E	S	S	S
OUTER					
	Low Rate	SM	S	S	S
	Tensile	ER	N.S	S	N.S
	(CHS=2.0)	E			
INNER					
	Low Rate	SM	S	S	S
	Tensile	ER	S	S	N.S.
	(CHS=2.0)	E	N.S.	S.	S.
OUTER					
	Triaxial	SM	S	S	S
	Tensile	ER	N.S	S.	S.
	(CHS=1750/	E	N.S	N.S	N.S
	500 psi)				
INNER					
	Triaxial	SM	N.S.	N.S	S
	Tensile	ER	N.S.	S.	S.
	(CHS=1750/	E	N.S	N.S.	N.S
	500 psi)				

TABLE 34 (cont)

Analysis of Covariance
Motor to Motor Comparing 22135, 22583 and 22788 at the 5% Significance Level,
Test Temp. = 77°F, Dissected Only

Test	Tensile Test	Regression Line Comparisons: Slopes	Elevations	Effects Due Due to Age
OUTER				
Stress	10 sec	N.S	S.	N.S
Relaxation	50 sec	N.S.	S.	N.S.
0.5% Strain	100 sec	N.S	S.	N.S.
	1000 Sec	N.S.	S.	N.S.
INNER				
Stress	10 sec	N.S.	S.	N.S.
Relaxation	50 Sec	N.S.	S.	N.S
0.5% Strain	100 sec	N.S.	S.	N.S.
	1000 sec	N.S.	S.	N.S.
OUTER				
Hardness (Shore A)	10 sec	S.	S.	S.
INNER				
Hardness (Shore A)	10 sec	S.	S.	N.S

NOTE: NS = Not Significant
S = Significant
The Regression Elevation is Y-AXYS Intercept

TABLE 35

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X (CORRECTED SUMS OF SQUARES AND PRODUCTS)	XY	Y	DF (DEVIATIONS ABOUT REGRESSION)	SS	MS	REGRESSION COEFFICIENT
135	26	0.312212E+04	-.167250E+03	0.204801E+03	25	0.195841E+03	0.783365E+01	-.535693OE-01
583	29	0.101150E+05	-.412562E+03	0.940945E+03	28	0.924118E+03	0.330042E+02	-.4078719E-01
788	29	0.798700E+04	0.138897E+04	0.399277E+03	28	0.155320E+03	0.554713E+01	0.1756513E+00
WITHIN	84	0.211441E+05	0.809062E+03	0.154502E+04	83	0.151406E+04	0.182417E+02	0.3826417E-01
AMONG	2	0.132487E+04	-.464437E+03	0.170352E+03	1	0.754211E+01	0.754211E+01	
TOTAL	86	0.224690E+05	0.344625E+03	0.171537E+04	85	0.171809E+04	0.201187E+02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 7.5833 DF = 2. 81
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 5.3729 DF = 2. 83
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.6971 DF = 1. 83

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) V.L.RATE (X-HO/SPEED =0.0002) 77 DEG F. MAX STRS

TABLE 36

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	26	0.312212E+04	-.334009E+01	0.118122E-01	25	0.823893E-02	0.329557E-03	-.1069810E-02
583	29	0.101150E+05	-.566870E+01	0.176420E-01	28	0.144651E-01	0.516611E-03	-.5604301E-03
788	29	0.790708E+04	-.598291E+01	0.217943E-01	28	0.172673E-01	0.616668E-03	-.7566608E-03
WITHIN	84	0.211441E+05	-.149917E+02	0.512485E-01	83	0.406190E-01	0.489386E-03	-.7090201E-03
AMONG	2	0.132487E+04	-.293701E+01	0.133762E-01	1	0.486537E-02	0.486537E-02	
TOTAL	86	0.224696E+05	-.179287E+02	0.646248E-01	85	0.503189E-01	0.591987E-03	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.6563 DF = 2, 81
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 9.9103 DF = 2, 83
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 21.7200 DF = 1, 83

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) V.L.RATE (X-HD/SPEED =0.0002) 77 DEG F. STRN/RUP

TABLE 37

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X (CORRECTED SUMS OF SQUARES AND PRODUCTS)	XY	Y	DF (DEVIATIONS ABOUT REGRESSION)	SS	MS	REGRESSION COEFFICIENT
135	26	0.312212E+04	0.101100E+04	0.995910E+05	25	0.992636E+05	0.397054E+04	0.323817E+00
563	29	0.101150E+05	-.265400E+04	0.698750E+05	28	0.691786E+05	0.247067E+04	-.262382E+00
798	29	0.790700E+04	0.122290E+05	0.944830E+05	28	0.755696E+05	0.269891E+04	0.154660E+01
WITHIN	84	0.211441E+05	0.105860E+05	0.263949E+06	83	0.258649E+06	0.311625E+04	0.500659E+00
AMONG	2	0.122487E+04	0.487700E+04	0.829590E+05	1	0.650063E+05	0.650063E+05	
TOTAL	86	0.224690E+05	0.154630E+05	0.346908E+06	85	0.336266E+06	0.395607E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.4294 DF = 2. 81
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 12.4536 DF = 2. 83
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.7008 DF = 1. 83

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) V.L.RATE (X=HD/SPEED =0.0002) 77 DEG F. MODULUS

TABLE 38

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	40	0.131369E+05	-.546062E+03	0.153987E+04	39	0.151718E+04	0.369021E+02	-.4156063E-01
583	35	0.118870E+05	0.115669E+04	0.989562E+03	34	0.877009E+03	0.257944E+02	0.9730691E-01
788	37	0.949937E+04	0.109106E+04	0.786062E+03	36	0.660747E+03	0.183541E+02	0.1148569E+00
WITHIN	112	0.345253E+05	0.170169E+04	0.331550E+04	111	0.323163E+04	0.291138E+02	0.4928800E-01
AMONG	2	0.588969E+04	0.356537E+04	0.215806E+04	1	-.268555E+00	-.268555E+00	
TOTAL	114	0.404150E+05	0.526706E+04	0.547356E+04	113	0.478713E+04	0.423640E+02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.1522 DF = 2. 109
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 26.7143 DF = 2. 111
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 2.8809 DF = 1. 111

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECT (INNER) V.L.RATE (X-HD/SPEED =0.0002) 77 DEG F. MAX STRS

TABLE 39

ANALYSIS OF COVARIANCE TABLE

		CORRECTED SUMS OF SQUARES AND PRODUCTS			DEVIATIONS ABOUT REGRESSION			
SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
135	40	0.131389E+05	-.428516E+01	0.419559E-01	39	0.405583E-01	0.103996E-02	-.3261400E-03
523	35	0.118870E+05	-.247900E+01	0.268448E-01	34	0.283278E-01	0.833171E-03	-.2085500E-03
788	37	0.949937E+04	-.582373E+01	0.995102E-01	36	0.959398E-01	0.266500E-02	-.6130601E-03
WITHIN	112	0.345253E+05	-.125879E+02	0.170711E+00	111	0.165721E+00	0.149299E-02	-.3646000E-03
AMONG	2	0.568969E+04	-.246113E+02	0.206572E+00	1	0.103728E+00	0.103728E+00	
TOTAL	114	0.404150E+05	-.371992E+02	0.376863E+00	113	0.342643E+00	0.303224E-02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.2961 DF = 2, 109
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 59.2510 DF = 2, 111
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 3.0741 DF = 1, 111

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) V.L.RATE (X-HD/SPEED =0.0002) 77 DEG F. STRN/RUP

TABLE 40

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS: X	XY	Y	DEVIATIONS ABOUT REGRESSION: DF	SS	MS	REGRESSION COEFFICIENT
135	40	0.131389E+05	-.116490E+05	0.111321E+06	39	0.100993E+06	0.258956E+04	-.8866012E+00
583	35	0.118870E+05	0.831637E+04	0.541840E+05	34	0.483657E+05	0.142252E+04	0.6996197E+00
788	37	0.949937E+04	0.106786E+05	0.638690E+05	36	0.518649E+05	0.144069E+04	0.1124137E+01
WITHIN	112	0.345253E+05	0.734594E+04	0.229374E+06	111	0.227811E+06	0.205235E+04	0.2127694E+00
AMONG	2	0.588969E+04	0.466351E+05	0.434251E+06	1	0.649906E+05	0.649906E+05	
TOTAL	114	0.404150E+05	0.559810E+05	0.663625E+06	113	0.591524E+06	0.523473E+04	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 7.2010 DF = 2, 109
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 88.6089 DF = 2, 111
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.7616 DF = 1, 111

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) V.L.RATE (X-HD/SPEED =0.0002) 77 DEG F. MODULUS

TABLE 41

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X (Corrected Sums of Squares and Products)	XY	Y	DF (Deviations about Regression)	SS	MS	REGRESSION COEFFICIENT
135	29	0.988925E+04	-.539175E+04	0.748619E+04	28	0.454653E+04	0.162376E+03	-.545213?E+00
583	22	0.134?77E+05	-.168444E+04	0.746175E+04	21	0.725045E+04	0.345259E+03	-.125444?E+00
788	29	0.910350E+04	0.763937E+03	0.464344E+04	28	0.457983E+04	0.163565E+03	0.835873?E-01
WITHIN	80	0.324205E+05	-.631525E+04	0.195914E+05	79	0.183612E+05	0.232420E+03	-.194791?E+00
AMONG	2	0.315550E+04	0.212187E+04	0.177656E+04	1	0.349736E+03	0.349736E+03	
TOTAL	82	0.355760E+05	-.419337E+04	0.208737E+05	81	0.203794E+05	0.251597E+03	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 4.6651 DF = 2. 77
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 4.3416 DF = 2. 79
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 5.2928 DF = 1. 79

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) L.RATE (X=HD/SPEED =0.2) 77 DEG F. MAX STRS

TABLE 42

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	27	0.987475E+04	0.123591E+02	0.227302E+00	26	0.211633E+00	0.814742E-02	0.1251584E-02
583	22	0.134277E+05	0.259644E+01	0.161916E+00	21	0.161416E+00	0.768645E-02	0.1933630E-03
738	29	0.910350E+04	0.886108E+01	0.227329E+00	28	0.218504E+00	0.780371E-02	0.9733711E-03
WITHIN	78	0.324060E+05	0.238167E+02	0.616348E+00	77	0.598844E+00	0.777720E-02	0.7349451E-03
AMONG	2	0.293800E+04	-.198909E+02	0.135261E+00	1	0.595331E-03	0.595331E-03	
TOTAL	80	0.353440E+05	0.392576E+01	0.751609E+00	79	0.751173E+00	0.950651E-02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.4494 DF = 2. 75
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 9.7933 DF = 2. 77
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 2.2507 DF = 1. 77

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) L.RATE (X-HD/SPEED =0.2) 77 DEG F. STRN/RUP

TABLE 43

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X	XY	Y	DF	SS	MS	REGRESSION COEFFICIENT
		CORRECTED SUMS OF SQUARES AND PRODUCTS				DEVIATIONS ABOUT REGRESSION		
135	25	0.866262E+04	-.602590E+05	0.345130E+07	24	0.268102E+07	0.111709E+06	-.959734[illegible]E+01
583	22	0.134277E+05	-.344800E+04	0.375694E+06	21	0.374208E+06	0.178194E+05	-.256781[illegible]E+00
788	26	0.770269E+04	-.524400E+04	0.508928E+06	25	0.505358E+06	0.202143E+05	-.680801[illegible]E+00
WITHIN	73	0.294931E+05	-.889510E+05	0.433532E+07	72	0.404704E+07	0.564867E+05	-.3015997E+01
AMONG	2	0.319394E+04	0.541090E+05	0.126614E+07	1	0.349469E+06	0.349469E+06	
TOTAL	75	0.326870E+05	-.348420E+05	0.560146E+07	74	0.558432E+07	0.751934E+05	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 4.9784 DF = 2, 70
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 13.2533 DF = 2, 72
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 4.7494 DF = 1, 72

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (OUTER) L.RATE (X-HD/SPEED =0.2) 77 DEG F. MODULUS

TABLE 44

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	30	0.988094E+04	-.392019E+04	0.430037E+04	29	0.274507E+04	0.946576E+02	-.3967425E+00
583	30	0.131587E+05	-.174519E+04	0.728625E+04	29	0.705679E+04	0.243338E+03	-.1326254E+00
788	28	0.105288E+05	0.743250E+03	0.437731E+04	27	0.432484E+04	0.160179E+03	0.7059199E-01
WITHIN	88	0.335685E+05	-.492212E+04	0.159659E+05	87	0.152442E+05	0.175221E+03	-.1466293E+00
AMONG	2	0.191750E+04	0.633512E+04	0.209601E+05	1	-.210936E+00	-.210936E+00	
TOTAL	90	0.354860E+05	0.141300E+04	0.368960E+05	89	0.368397E+05	0.413930E+03	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.3620 DF = 2, 85

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 61.6237 DF = 2, 87

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 4.1190 DF = 1, 87

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)

STAGE II DISSECTED (INNER) L.RATE (X-HD/SPEED =0.2) 77 DEG F. MAX STRS

TABLE 45

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
135	30	0.960694E+04	0.192561E+02	0.100012E+00	29	0.624852E-01	0.215466E-02	0.194681*E-02
583	30	0.131587E+05	0.426294E+01	0.931016E-01	29	0.917806E-01	0.316465E-02	0.323962OE-03
788	26	0.105268E+05	0.142515E+02	0.632668E-01	27	0.439765E-01	0.162876E-02	0.135356AE-02
WITHIN	86	0.335685E+05	0.377705E+02	0.256440E+00	87	0.213942E+00	0.245910E-02	0.1125177E-02
AMONG	2	0.191750E+04	-.250049E+02	0.353957E+00	1	0.278847E-01	0.278847E-01	
TOTAL	90	0.354860E+05	0.127656E+02	0.605805E+00	89	0.601213E+00	0.675520E-02	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.3657 DF = 2, 85
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 78.7424 DF = 2, 87
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 17.2821 DF = 1, 87

ANALYSIS OF COVARIANCE (MOTOR TO MOTOR)
STAGE II DISSECTED (INNER) L.RATE (X-HD/SPEED =0.2) 77 DEG F. STRN/RUP